

An Exploration of Professors' Use of Twitter in Higher Education

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Abstract

Scant research has explored how professors in Canadian universities use Twitter as a teaching tool or to augment knowledge about their subject disciplines. This case study employed a mixed-method approach to examine how professors in an Ontario university use Twitter. Using a variation of the technology acceptance model, the survey ($n = 17$) found that professor participants—41.2% of whom use Twitter—perceive Twitter as somewhat useful as a teaching tool, not useful for finding and sharing information, and not useful for personal use. Participants' gender and number of years teaching are not indicators of Twitter use. Furthermore, the level of support from peers and the university may be reasons why some do not use Twitter or have stopped using Twitter. Face-to-face interviews ($n = 3$) revealed that Twitter is not used in classrooms or lecture halls, but predominantly as a means of sharing information with students and colleagues. Another deterrent to using Twitter is not knowing who to follow. Findings indicate that some professors at this university embrace Twitter, but not necessarily as an in-class teaching tool. The challenge and the advantage of using Twitter is to discover and follow people who tweet material and to select relevant material to pass along to students and colleagues. Professor participants in the study found a use for the social network as a means to increase student engagement, create virtual information-exchange communities, and enrich their own learning.

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CHAPTER ONE: INTRODUCTION TO THE STUDY

“I’ve always believed that everything is better when you share it” – Oprah Winfrey (2008)

This is an exploratory study of how professors at a medium-size Southern Ontario university use Twitter as a teaching tool and for professional development. Since the introduction of social networks in the mid-2000s, people have connected with each other to share information, reach out to those with similar interests, discuss topics, and interact. One of the most popular social networking sites (SNS) is Twitter, which launched on July 15, 2006 (Arrington, 2006). Because of Twitter’s increasing popularity and the arguably ubiquitous use of SNS amongst students, it is important to explore the extent of professors’ use of Twitter as a teaching tool and for professional development. A number of American studies examine Twitter use in higher education (Jones, Gaffney-Rhys, & Jones, 2011; Malesky & Peters, 2012; “Social Media Usage,” 2011; “Twitter in Higher Education,” 2010), but very little is known about its use in Canadian postsecondary education and, more specifically, how professors and other educators in higher education use Twitter both professionally and in their personal lives. In addition to the scarcity of Canadian research, there are also distinct differences in nationwide broadband use and availability between the two countries, which may have an impact on social network use. Furthermore, the structure of postsecondary education is markedly dissimilar in Canada and the United States, which may create differences in how Twitter and other social networks are used by professors in the two countries.

This paper provides a uniquely Canadian perspective on how some Canadian professors use Twitter and investigates why some professors are not using Twitter. Ultimately, this study will shed light on how academics are using Twitter to reshape their

teaching practices, maintain currency in their subject discipline, and gain further knowledge about pedagogy.

A Brief Introduction to Twitter

Twitter is a free microblogging site that allows users, known as *tweeps*, to post messages that are read by other tweeps. The term *microblog* best describes Twitter because the platform is similar to a blog but with a limit of 140 characters and spaces per message, which is known as a *tweet*. According to eBizMBA (“Top 15,” 2012), Twitter is the second most popular social network with approximately 250 million unique monthly visitors while Facebook remains the leader with 750 million unique monthly visitors. Unlike Facebook users, tweeps do not necessarily know each other personally or may not have met Twitter users with whom they are connected. Instead, they follow each other based on how relevant the tweets are to them. The content of the tweet is more important than the person sending the message.

Twitter uses two communication signs uniquely. One is the @ symbol and the other is called a *hashtag*, which is symbolized as #. The @ symbol is used directly in front of a tweep’s name; for example, @JanetSymmons. When this is used, the tweet will then be public, be visible to all who follow the person who sent the message, and also appear in the Twitter stream of the person with the @. When a hashtag is followed by a word and typed into Twitter’s search box, it shows all recent tweets using the hashtag. For maximum effectiveness, tweets include hashtags so that other users can easily find the information. Streams can be saved so that the mention of a specific word or hashtag can be followed. For example, a Twitter stream dedicated to #highered shows the user recent mentions about higher education, and #CDNpse shows all tweets that use this

hashtag for Canadian postsecondary education. In addition to a search function, hashtags are used for group chats. For example, people working on a PhD might follow #PhDchat. A tweet can also include links to blogs, articles, and pictures. In addition, Twitter maintains a direct message function, which allows private communication between tweeps who follow each other.

For the sake of clarity, it is important to note the difference between the terms *social media* and *social network*. According to the Oxford Dictionaries (2013), social media is the collection of “websites and applications that enable users to create and share content or to participate in social networking” (para.1), which is different from the actual networks people use. Boyd and Ellison (2007), in turn,

define social network sites as web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. (p. 211)

Thus, social media is the technology that supports networks such as Twitter and Facebook.

Background of the Problem

It is important to understand Twitter from a number of perspectives, such as how Twitter is used as a teaching tool, to communicate with students, for professional development (PD), and to link up with the social network culture at the university. Traditionally, the term “professional development” has been reserved for teachers employed in elementary or secondary education. According to Guskey (2000) “many teachers and school administrators regard professional development as special events that

are restricted to three or four days during the school year” (p. 14). Events such as these are not a requirement for professors. Instead universities may offer sessions or workshops that provide training on how to use a new technology, such as SMART boards, that the school is deploying in many classrooms. Workshops are not specific to a subject discipline, which suggests that discovering current and relevant information about a subject discipline is the responsibility of professors, and not the university. According to Shagrir (2012), PD is “an ongoing and systemic process that includes activities such as discussion, investigation, experimentation with new practices, learning, expansion of knowledge, acquisition of new skills” (p. 23). To this end, PD for academics should ideally entail the search for current knowledge about subject disciplines, teaching practices, and tools to enhance both. For the purpose of this research, PD is defined as the process by which professors use Twitter to find and share information about their subject discipline and information about educational practices.

Twitter as a Teaching Tool

Some educators use Twitter to connect with students and to augment their teaching practices. Dunlap and Lowenthal (2009) state that “Learning takes place in a social context” and that SNS “have great potential for enhancing the social context in support of learning” (para. 9). They also acknowledge that not all educators support the implementation of Twitter and they have received feedback that focused on three types of objections: “(a) Twitter takes too much time, (b) the content is of questionable value, and (c) it promotes social (or, anti-social) myopic-ness” (para. 2). These findings concur with those obtained through a survey conducted by *Faculty Focus* (“Twitter in Higher Education,” 2010), which found that some people in higher education “consider Twitter a

forum for the self-absorbed and a colossal waste of time” (p. 4). Interestingly, the survey also found that 35.2% of the respondents use Twitter (p. 5) and that 31.9% “occasionally” or “frequently” use Twitter to communicate with students; however, only 23.6% “occasionally” or “frequently” use Twitter as a learning tool in the classroom (p. 5). The *Faculty Focus* research also indicates a modest increase of Twitter adoption amongst those in higher education from the previous year. The *Faculty Focus* 2011 survey (“Social Media Usage,” 2011) asked participants who were not using Twitter in the classroom how likely they would be to start using it by 2014. Not surprisingly, 37.3% replied that this was “not likely,” but 11.4% stated it was “very likely” (p. 18). It may appear that there is room for growth, but there also may be some hesitation by postsecondary educators to embrace Twitter as a teaching tool.

While these are American statistics, Canadian statistics are not readily available nor do they contain as many details. According to Gauthier (2011), 14.5% of Canadians have Twitter accounts and only 6.2% of these people are regular users (paras. 4 & 6). This is vastly different from Semiocast’s (2012) report noting that 7 million people in Canada, or 28% of the Canadian population, have active Twitter accounts. Regardless, with such low numbers, one might wonder whether Twitter is a viable teaching tool. But numerous researchers (Badge, Johnson, Moseley, & Cann, 2011; Dunlap & Lowenthal, 2009; Jones et al., 2011; Junco, Elavsky, & Heiberger, 2012) have found that Twitter is used by professors to enhance student communication even though many students prefer to use Facebook and have not yet tried or become fully engaged on Twitter (Badge et al., 2011; Rinaldo, Tapp, & Laverie, 2011; “Twitter in Higher Education,” 2010). Many professors, however, who have invested time into using Twitter find that it is an

important teaching tool that increases student engagement (Dunlap & Lowenthal, 2009; Junco, Heiberger, & Loken, 2011; “Twitter in Higher Education,” 2010).

Twitter for Professional Development

In the world of instant information, many professors have turned to Twitter to find and share information about their subject discipline and information about educational practices, herein referred to as professional development or PD. Unlike elementary and secondary school teachers, professors are not obligated to participate in formal professional development activities, such as workshops or seminars. Thus, it is the responsibility of each professor to maintain current with teaching practices and advances in her or his subject discipline. This has lead some professors, and other professionals, to Twitter where they have created professional learning networks (PLNs) that are comprised of peers, professional organizations, and sources for news about their area of expertise, such as higher education.

According to Lalonde (2011), educators use Twitter “to connect and exchange information with colleagues and peers,” which is referred to as a personal learning network, or PLN (p. 8). Thus, people use networks to make connections with other people, who they may or may not know, and share information for the purpose of learning. It is important to differentiate between a PLN and a personal learning environment (PLE). Similar to the connection between social media and social networks, PLEs are systems and PLNs are connections people make using the systems. According to Saadatmand and Kumpulainen (2013), PLEs are “technology-mediated learning environments which are more open, flexible, and student-centered” (p. 70). According to Veletsianos (2012), PLNs are created to request resources that professors could use in the

classroom, look for resources “that would enhance their skills and/or practice,” and search for information “relevant to their scholarship and research” (p. 343). While conferences and journals continue to play a role in PD, a PLN is a customized and instant connection to relevant information that helps professors aggregate information and share it with others. The customization of a Twitter PLN is time-consuming, but researchers have found that many who have created a Twitter PLN find it useful, engaging, and rewarding (Boss, 2011; Carrigan, 2012; Davis, 2011; Dobler, 2012; “Twitter in Higher Education,” 2010).

While the efforts of faculty to create PLNs should be applauded, there are some educators, such as Whitby (2012), who question whether self-guided development is beneficial because some professors are not aware of what areas they need to develop. The value of information and self-driven learning on Twitter raises the question of whether tweets are merely echoed within a group. Carrigan (2012) believes that academics on Twitter are in a “relatively self-enclosed ecosystem” (para 2), but Warlick (2009) does not support this, stating that it is the reflection on knowledge, the re-shaping for the knowledge, and the connection with new people that helps PLNs maintain growth and vibrancy. As connections increase, PLNs grow, thus adding more options, ideas, and facts to conversations and research. In addition, many professors find the synchronous and informal interactions to be useful (Trust 2012; Warlick, 2009). Some have also stated that many educators are naturally motivated to seek out new information and to help and support each other (Hulse, 2012; Trust 2012); however, if this is true, then it is reasonable to question why the majority of professors do not use Twitter as part of their PLN.

Perhaps the lack of structure has contributed to Twitter’s maligned reputation in

education. According to Davis (2011), this bias is not consigned only to Twitter, but also other SNSs, webinars, and online conferences as school districts are “struggling to determine how they fit into required [PD] credits” (p. S13). While some centres of learning are unprepared to support and embrace non-traditional professional development, it is not surprising that some respondents to the *Faculty Focus* survey (“Twitter in Higher Education,” 2010) believe that Twitter is not relevant to education, in part, perhaps, because postsecondary institutions do not acknowledge its usefulness.

The University and Social Networking

The medium-sized university in this study is located in Southern Ontario. It has approximately 600 professors who work in seven faculties. As with other universities, it maintains a website, has an extensive social media presence, and is active on eight SNS, including Twitter. According to the website, the university uses social networks to target its four audiences: Students, faculty, staff, and the community. The social media page on the website contains resources and tips to help people use SNS, including Twitter.

The university understands the challenges of staying both connected and competitive in the higher education industry while maintaining and leveraging its brand using a variety of social media platforms. It states that the three key offices where social media play significant roles are in marketing and communications, recruitment and liaison, and alumni relations. There appears to be a clear commitment by the university to leverage the power of social media to build awareness of its offerings plus enhance social conversations with both internal and external audiences.

Unfortunately, the social media commitment to branding and other forms of public relations and marketing is not mirrored in the university’s commitment to

providing SNS training to faculty and teaching assistants. As with other institutions, the university has a centre for faculty learning, which provides workshops related to improving teaching practices. Curiously, no workshops for SNS use as teaching tools, learning tools, or for professional development are listed. The website states that it encourages faculty use of SNS but does not offer advice or tips to implement SNS for teaching. Instead, the page contains links to the faculty handbook, students' rights, the Freedom of Information Act, and the university's social media marketing guidelines. This gives the intimidating impression that faculty use of SNS is fraught with restrictions and red tape.

There appears to be a disconnect between the public relations and marketing social media efforts and the actual training, deployment, and innovative encouragement that faculty receive to support both teaching initiatives and professional development. Collectively, the university's website pages provide the impression that the university understands how to maintain a social media presence, but does not understand how to use social networks beyond public relations and marketing. Indeed, while the university states that it supports faculty use of SNS, it does not offer advice about how to use these tools for the two main outputs of its business: teaching and research. Instead the emphasis is on using SNS to increase funding through alumni and student recruitment.

Purpose of the Study

The purpose of this study is to discover the extent of faculty members' acceptance of technology, particularly Twitter, at a midsize Canadian university. Discovering professors' motives toward Twitter use may help future researchers understand why some professors are quick to try new teaching tools and other professors are more

apprehensive. To provide a clear picture of Twitter use, results are compared to how professors use Twitter with other social networks as teaching tools, for PD, and for personal use.

Research Questions

While gathering data about Twitter use is one goal, it is equally important to discover the motivations that professors have towards adopting SNS use. With this in mind, the nucleus of the survey and focus group questions align with the following research questions:

- RQ 1: What motivates professors to use Twitter as a teaching tool and for professional development?
- RQ 2: How do professors use Twitter as a teaching tool and for professional development?

Not all professors use Twitter or other SNS. For non-Twitter users, the same RQs apply, but RQ 1 is reworded to better understand non-use:

- RQ 3: What are the de-motivating factors professors have to using Twitter as a teaching tool and for professional development?

Rationale

Very little is known about Twitter use in Canada and there is no available research about Canadian faculty use of Twitter. Van Grove (2012) recently stated that, as of February 2012, “31% of 18- to 24-year-old Internet users are now Twitter users. ... The figure represents 74% growth from May 2011” (para. 3). Although these are American statistics, it is conceivable that there is also an increase in Twitter use amongst Canadians. There are, however, a number of fundamental differences between U.S. and

Canadian SNS use, such as broadband access and academia itself. Specifically, the U.S. has more Internet service providers, resulting in a more competitive market, but less availability in rural areas (Griffith, 2012; Yu, 2012). With the rate of Twitter usage growing in the age group that represents the majority of university students, it is only logical that educators should investigate how to use Twitter to augment their teaching practices. According to Turpin, Sager, Tait, and De Decker (2009), Canada is moving towards a knowledge economy and universities provide industries with graduates who “create the knowledge that drives innovation, productivity, and competitiveness for tomorrow” (p. 4). Thus, industries and students alike expect professors to deliver education material that is relevant and up-to-date and to possess an awareness of technologies, processes, and procedures used in their discipline. Social networks are ubiquitous with students on university campuses across Canada and are increasingly used by industries for recruitment, branding, and creating a connected workplace. As technologies and social networks continue to penetrate nearly all aspects of life, it becomes apparent that if professors wish to stay abreast of educational changes, they must increasingly use technology.

With this in mind, we must first discover how professors are using Twitter, what percentage are using Twitter, and for what purposes. Only once we understand the current state of Twitter use can we further explore its usefulness and its position as teaching tool in higher education.

Theoretical Framework

As this study explores the perception of Twitter use as opposed to actual use of the social network tool, it is therefore logical to turn to models and theories that have

previously explored perceptions and technology. Davis created the Technology Acceptance Model (TAM) in 1989 in an effort to understand why some people accept technology while others reject technology based on their perceived ease of use of the technology and the perceived usefulness of the technology. In 2003 Venkatesh, Morris, Davis, and Davis created the Unified Theory of Acceptance and Use of Technology (UTAUT) theory. This theory delved into direct determinants of user acceptance of technology, such as performance expectancy, effort expectancy, social influence and facilitating conditions. Finally, Salajan, Welch, Peterson, and Ray (2011) examined TAM and studied this in relationship to faculty use of two learning management systems. These three studies provide a basis on which this exploratory research can be measured against. Further details about the framework will be discussed in a subsequent section.

Scope and Limitations of the Study

This is a study of how professors at a medium-size Southern Ontario university use Twitter as a teaching tool and for PD. While a number of other technologies and SNS are used for comparative purposes, this study does not provide depth of understanding for these technologies. Findings from this study may not be indicative of Twitter use at all Canadian universities because of the geographical size and regional differences in Canada. Additionally, because only a single, medium-size university is included in the study, conclusions do not necessarily apply to other Canadian universities. However, this study provides other researchers with a body of knowledge that may assist in their research of Twitter use in Canada in higher education. This is an exploratory study with an expected low response rate due to the subject matter, instrumentation, and the limited contact information of professors. Nonetheless, this research creates the foundation for

future planned research into testing the technology acceptance model with Twitter use in higher education.

Document Outline

Chapter 2 comprises a review of related literature that provides a brief history of social networking sites, which will introduce the reader to the five most visited SNS. This explanation will provide a context in which to better understand how Twitter is situated in SNS. The literature review also provides information about the digital divide that may exist between professors and students. The chapter concludes with an examination of how professors are using Twitter in higher education.

Chapter 3 presents the research methodology and describes how the research was conducted, including information about the participants, research design, data collection, and the description of the processes used for qualitative and quantitative methods, along with assumptions and limitations of the chosen methodology.

Chapter 4 presents the results of the study and chapter 5 includes a summary, discussion, and implications.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

“I feel it is not appropriate to use these [SNS] tools academically or communicate with students through the tools,” said one respondent to the 2011 *Faculty Focus* survey (“Social Media Usage,” p. 10). “[I] still can’t figure out an academic use for Twitter” (p.10) said another respondent. “I have five Twitter accounts,” said another faculty member; “two personal accounts and three that I use in classes” (p. 10).

Judging by the responses from the *Faculty Focus* survey, many faculty members have a strong opinion about Twitter use in higher education, but few would dispute that Twitter is an emerging social network that has seen an increased use as a teaching tool in recent years. Twitter use has transformed how some professors communicate with students, colleagues, and peers, in addition to helping them stay abreast of emerging trends in education and in their subject discipline. This chapter will explore the juxtaposition between professors who engage with students via Twitter. To gain a better understanding of the challenges facing professors who have decided to embrace the microblog and to comprehend the fierce resistance to it, we must start with a brief history of SNS and then explore who is using them today. This will provide the reader with the context of the dilemma and guide us to understand the differences between digital natives and digital immigrants, which will enable us to appreciate the challenges facing both populations as they use social networks in higher education. As the majority of research has been conducted in the United States, it is important to learn more about differences in the academic climate as well how the Internet service provider structure plays a role in social network use between Canada and the U.S. As educators move into using Twitter as a teaching tool, it is important to understand the theoretical framework that may be used to

test the viability and validity of using Twitter for teaching. This, too, will be explored. Finally, I will examine how professors use Twitter as a tool and for professional development.

Theoretical Framework

While this paper explores how professors use Twitter as a teaching tool, it is important to first understand the predominant technology acceptance theories and the learning theory against which teaching with Twitter can be measured. No single theory can adequately address all topics, concerns, and models in a field of study; however, researchers tend to favour certain theories over others. Of particular interest are the Technology Acceptance Model (TAM), which explores perceived usefulness and perceived ease of use from an end user's perspective and the Unified Theory of Acceptance and Use of Technology (UTAUT) theory.

Davis (1989) developed the TAM theory in an effort to “pursue better measures for predicting and explaining use” (p. 318) of information technology and information systems. Davis investigated what caused “people to accept or reject information technology” (p. 320) using two variables: perceived usefulness and perceived ease of use (p. 320). Davis found “one of the most significant findings is the relative strength of the usefulness-usage relationship compared to the ease of use–usage relationship” (p. 333). This result suggests that users must intrinsically understand and internally accept the personal benefits of learning, using, and implementing the technology prior to learning the technology. Essentially, it is a “what’s in it for me?” attitude and the benefits of using the technology must outweigh the perceived drawbacks, such as the time invested in

learning the technology, the amount of time need to maintain the use of the technology, and the difficulty of learning the technology.

The number of acceptance models increased between 1989 and 2003. Venkatesh, Morris, Davis, and Davis (2003) analyzed eight technology acceptance models, including TAM, and integrated them to create the UTAUT theory. This theory suggests

That performance expectancy appears to be a determinant of intention in most situations: the strength of the relationship varies with gender and age such that it is more significant for men and younger workers. The effect of effort expectancy on intention is also moderated by gender and age such that it is more significant for women and older workers, and those effects decrease with experience. (p. 467)

Venkatesh et al. suggest that there are four direct determinants of user acceptance of technology: performance expectancy (attaining gains in job performance), effort expectancy (ease of use), social influence (the degree to which an individual perceives how important others believe he or she should use the technology), and facilitating conditions (organization and infrastructure support of the technology). These determinants are moderated by gender, age, experience, and voluntariness of use (p. 447). The UTAUT theory suggests that the older generation of workers and those with little experience using technology perceive that there is more effort required to use technology (p. 469). The theory also claims that males and younger workers perceive increased pressure to be proficient with the technology, known as performance expectancy (p. 468).

Salajan, Welch, Peterson, and Ray (2011) reviewed TAM for faculty use and extended the model to include peer influence (support and encouragement from fellow faculty to learn and use the technology) and perceived quality of teaching (a faculty

member's perception of his or her quality of teaching). The study was limited to faculty use of two learning management systems (LMS): Blackboard and Wimba. Findings suggest, "perceived ease of use and peer influence did not have a statistically significant predictive effect on the perceived quality of teaching" (p. 341). Salajan et al. note that the findings "contradict Davis's (1989) causality effect in which perceived ease of use informs perceived usefulness" (p. 342). Salajan et al. suggest that the discrepancy may correspond to participants in the study who place "primary importance" on why they are using the LMS, with only a distant secondary concern on the amount of effort they put into learning and using the LMS technology (p. 342). If this is true for using an LMS, it may also be true for using other technologies. It appears that Salajan et al. have discovered an area that requires further research to gain a clearer understanding of faculty motivations and apprehensions about technology use; nonetheless, Salajan et al. have identified two factors that can be used in this study.

History of Social Networking Sites

When computers began making their way into consumers' homes in the early 1980s, people wanted to communicate with each other, which was done via BBS, an abbreviation of *bulletin board system*. Each BBS was tailored for individuals with specific interests, such as hobbies or sports. Users logged into a BBS to chat, post messages, and upload content. By the mid-1990s, thanks to improved technology and bandwidth, sites that were true communities began to appear on the Internet. SixDegrees.Com, which launched in 1997, appears to be the first social network where users could create a profile and connect with friends (boyd & Ellison, 2007, p. 214). The early to mid-2000s saw a great expansion of SNS, such as Friendster in 2002, Myspace

and LinkedIn in 2003, Facebook in 2004, and Twitter in 2006. According to EBizMBA (“Top 15,” 2012), Facebook currently receives more unique monthly visitor than any other SNS. Facebook receives 254.5 million more monthly unique users than the total of Twitter, LinkedIn, Myspace, and Google Plus combined (“Top 15,” 2012). Such numbers indicate the global reach of SNS and illustrate how networks have become the fabric that creates links and bonds between people on a global scale. With such a vast scope and influence, it would be naïve to assume that SNS are not used in higher education.

The following sections will provide a brief snapshot of three of the most popular SNS and provide a summary of Myspace and Google Plus. It is important to note that exact demographics are very difficult to obtain, with the exception of LinkedIn. Four of the five SNS do not provide data and it is difficult to ascertain the reliability of the sources of the data used. Nonetheless, it is important to include these data as they provide rough guidelines that can be used to gauge each SNS against each other.

Facebook

Facebook’s original purpose was to share photos and contact information amongst Harvard University students. Developed by a group of Harvard students lead by Mark Zuckerberg, a computer science and psychology major, Facebook debuted in 2004 but, according to Cassidy (2006), it was restricted to the university; however, it quickly expanded to universities throughout Canada and the United States. Facebook was opened for general public use by October 2006.

According to SocialBakers (2012), 70.83% of Canadians who are online have a Facebook account, which translates to 55.02% of the country’s population. In addition, the average Canadian Facebook user is connected to 190 friends, which is higher than the

global average of 130 friends per user (Breikss, 2011). Unfortunately, a more detailed picture of Facebook use in Canada is not available; however, American research indicates that only 66% of the online population has a Facebook account (Pew Research Center, 2012b). According to Blog Herald (2012), the age distribution for American Facebook users is predominantly in the 18-34 age group, with 29% of users aged 18-25, and 23% of users aged 26-34, while the ages most represented by professors is lower. Approximately 18% of users are 35-44 and 12% are 45-54. Only 7% of Facebook users are 55 or older. Interestingly, *Faculty Focus* found that 84.6% of higher education faculty have a Facebook account (“Social Media Usage,” 2011, p. 7) and 46.1% use Facebook for both professional and personal use with an additional 2.8% using Facebook only for professional use (“Social Media Usage,” 2011, p. 9). It appears that higher education faculty have embraced Facebook use more than others in their age range.

Twitter

Twitter is a microblog that quickly gained popularity after the 2007 South By Southwest conference in Texas. In 2012, 15% of Americans were using Twitter, with 31% of its users in the 18-24 age range. This is an increase from 8% usage by Americans in 2010, with 16% of those users in the 18-24 age range (Pew Research Center, 2012c). It is estimated that the United States is home to 107 million Twitter accounts while Canada, in 10th place worldwide, has an estimated 7 million Twitter accounts (SemioCast, 2012).

Interestingly, the Pew study found that Twitter adoption dramatically decreases after age 44 to only 22% of the online population. Additionally, the 2011 Faculty Focus survey found that 50.2% of faculty have a Twitter account and of those users, 25% use it both professionally and personally, and another 12.5% use it only for professional

reasons (“Social Media Usage,” 2011, p. 7). Similar to the available Facebook statistics, faculty appear to have adopted Twitter more readily than the general population.

LinkedIn

Launched in 2003, LinkedIn was created to provide a platform for professional engagement among individuals, organizations, and groups with specific professional interests. According to LinkedIn Corporation (2012), LinkedIn has members in more than 200 countries and has a membership of 187 million; six million members are located in Canada and nearly 117 million are in the United States (para. 1).

LinkedIn is an important SNS to examine because its fastest growing populations are students and recent college graduates (LinkedIn Corporation, 2012, para.1). Unlike the Facebook age distribution, LinkedIn has an older demographic. Approximately 18% of LinkedIn users are 18-25, while those 26-34 account for 31% of users. There is a decrease in users between the ages of 35-44 (25%), while people aged 45-54 make up 15% of LinkedIn users. Finally, people 55 and older account for 11% of users (Blog Herald, 2012). It appears that, as with Facebook and Twitter, faculty have adopted LinkedIn more readily than the general population. According to *Faculty Focus*, 66.7% of faculty have a LinkedIn account (“Social Media Usage,” 2011, p. 7) and 42.6% of faculty use it only for professional purposes, whilst 17.6% use it for both personal and professional reasons (“Social Media Usage,” 2011, p. 9).

Other Social Networking Sites

Recent and reliable demographic information concerning Myspace could not be found. According to Stenovec (2011), Myspace, which launched in 2004, was the leading SNS until April 2008, when “Facebook and Myspace both [attracted] 115 million unique

monthly visitors globally” (slide 12). Decline in popularity continues and it is estimated that as of September 2012, there are only 54 million users worldwide (BBC, 2012) with nearly 29 million users in the U.S. (Wasserman, 2013). Conversely, Google Plus is rising in popularity with 105 million users, of whom 25% visit the site at least once a month (Wasserman, 2013). No studies are available about its use in higher education, but according to Plusdemographics (2012), 50.5% of users are between the ages of 18 and 24 and “student” is the most popular occupation.

Other SNS of note are YouTube, which is owned by Google, and Pinterest. Both of these SNS rely on posting visuals and leaving comments. YouTube is often used in the classroom as a teaching tool, as is TEDTalks.

The Digital Divide

In the 1980s and early 1990s, university students and professors did not attend classes with laptops, cell phones, and other digital equipment. It was still the age of chalkboards, pens, and paper. While these students have moved on to careers, some of the professors who taught then are still teaching today. Some of these professors may have had to make adjustments in their teaching practices as the digital age emerged. The current generation of students is known demographically by a variety of identifiers, such as digital natives, the net generation, Generation Y, and, according to renowned Canadian demographer David Foot (1998), the Baby-Boom Echo, who were born from 1980 to 1995 (p. 30). The majority of professors today are members of the three cohorts that comprise of Baby Boom, those who were born from 1947 to 1966. The remaining professors are part of the Baby Bust generation, a designation for people born between 1967 and 1979. Both generations are digital immigrants who were not born into a digital

world and may not embrace digitization as readily or with the same enthusiasm as digital natives.

Who Are Digital Natives?

Junco and Mastrodicasa (2007) refer to those born in and after 1980 as the net generation because “technology has always been part of their lives, and they are not intimidated in the least by technology innovation” (p. xii). Junco and Mastrodicasa go on to describe the general characteristics of the net generation as people with drive and who are social. In education, they tend to be experiential learners, and they are multitaskers in most facets of their lives (p. 138). From the day they were born, digital natives have been able to click a mouse and instantly find information, entertainment, and friends with whom to interact. This has had an impact on how they consume education and on their expectations of learning. According to Gaston (2006), “students who have been immersed in these environments are not accustomed to being passive receptors and have a very high expectation of the response time” (p. 13). This access and interaction with instant information combined with the expectation of being an active participant has most likely changed how digital native students perceive learning and how they want to engage with learning material. According to Handler (2012), some professors at UC Berkeley encourage tweeting in the lecture halls where their students’ tweets are projected on a screen for the learners and the professor to view. The students are more engaged, which increases the interaction amongst themselves and with the professor. Using SNS is the norm for the vast majority of the students. According to Madden and Zickuhr (2011), 83% of American Internet users between the ages of 18 and 29 are using an SNS (p. 4). With such a large proportion of students on SNS, it is little wonder that some of the

digital immigrant professors are connecting with their students using technology that these students use on a daily basis.

Who Are Digital Immigrants?

According to Foot (1998), the Baby Boom generation includes those born between 1947 and 1966, while the American boom took place from 1946 to 1964 and the Australian lasted from 1947 to 1976 (p. 25). Foot clarifies that the Canadian Baby Boom was the largest of the industrialized nations, equalling 32.4% of the population. Because of the size of the Canadian Baby Boom and different cultural and economic conditions, this group is best separated in to three discrete cohorts: The front-end Boomers (born in 1947 to the late 1950s), the mid-Boomers (late 1950s to 1960), and finally, Generation X (born between 1961 and 1966), who are also referred to as Gen-Xers (pp. 24-27).

Professors in Canada are Baby Boomers, with an increasing number of those born during the Baby Bust (1967 to 1979). The three cohorts and the Baby Busters all have different technological aptitudes, which may affect their attitudes towards adopting not only Twitter but other education technologies as well.

Foot (1998) explains that because of the recession in the early 1980s and a bloated labour market, many Gen-Xers were unemployed and could not afford computers or computer training. He suggests the front-end and mid-Boomers had jobs where they received computer training or could afford to purchase their own equipment. According to Foot, Baby Busters are increasingly employed in higher education perhaps because they tend to have more technical skills than Gen-Xers in addition to having more education and more talent gained through career opportunities (pp. 27-30).

Many front-end Boomers have resisted using SNS as professional tools, but as

they reach retirement, these Boomers will increasingly engage with others using SNS. In an interview with Dowd (2012), Madden clarified that “when we ask adults about their biggest motivations for using social networking sites, we find that for adults ages 50 and older, staying in touch with family is the number one reason they use social media” (para. 7). Interestingly, American researchers Zickuhr and Madden (2012) found that SNS use for those 65 and older has increased 150% from 2009 to 2011. It can be assumed that there is a similar increase of SNS use amongst Canadians over the age of 64, especially as the Canadian boom constitutes a larger percent of the population when compared the U.S. boom. According to Madden (2010), 47% of American Internet users between the ages of 50 and 64 use SNS, which is an increase of 25% from the previous year (p. 2). Clearly, front-end Boomers regard SNS as personal tools rather than for professional use. This may contribute to the lack of enthusiasm for using SNS as teaching tools or for PD. A respondent in the *Faulty Focus* survey stated,

I do not know the benefits of using it [Twitter] over something else and do not want to attend a campus session where the younger faculty are more tech oriented. Why take the RISK of trying something new when what I am doing now is working. (“Twitter in Higher Education,” 2010, p. 15)

Understanding the Digital Divide

It is important to place Twitter use in context with how those in higher education use SNS. According to Smith and Brenner (2012), only 15% of American adults who are online use Twitter. The researchers further state that 26% “of Internet users ages 18-29 use Twitter, nearly double the rate of those ages 30-49. Among the youngest Internet users (those ages 18 to 24), fully 31% are Twitter users” (p. 2). Furthermore, only 14% of

Baby Busters and Gen-Xers are using Twitter and front-end and mid-Boomers are using it even less, at only 9% (p. 3). It appears that digital natives are using Twitter more than digital immigrants, but it is important to note that only a small number of the population is using Twitter. According to these figures only 18.2% of the digital natives are using Twitter, while 30.7% of Baby Busters and Gen-Xers are using Twitter, and 29.6% of front-end and mid-Boomers are on Twitter. This indicates that Gen-Xers and Busters have adopted Twitter more readily than other cohorts. With these data in mind, it can be assumed that younger professors are using Twitter, but they are using it more than their students. And as discussed above, Gen-Xers tend not to be as computer savvy as cohorts who arrived before and after them. This may indicate that digital natives and Baby Busters are jointly using Twitter more than other cohorts combined. If this is true, then there may be an increased demand to use both Twitter and other SNS in education as the Baby Busters replace retiring Boomer professors and the digital natives fills the gap left by the junior professors who are currently Busters.

It must be acknowledged that the differences between the Boom, Bust, and Echo generations are generalities. While belonging to an age cohort may be a factor, it does not provide information about SNS use by subject discipline. For example, Gen-Xer professors who teach marketing or media studies may use SNSs more than professors who belong to any age cohort and teach professional degrees, such as law or engineering. This type of information may be uncovered during my research, but further studies should be undertaken to better understand the implication of SNS use by subject discipline.

Canadian and American Internet Service Providers and Academia

The difference in the economic structure of Canada and the U.S. is only one factor that plays an important role in how academics on both sides of the border use social networks. While this paper will not delve into the intricacies of the economies, I will explore Internet usage together with the population differences and the structure of academia, as they pertain to social network use.

Internet Usage

Although the Canadian population is approximately 11% that of the U.S. (Statistics Canada, 2011; United States Census Bureau, 2013), Canada has 5.5% greater Internet penetration (Dunning & Santhanakrishnan, 2012; Dunning & Sumner, 2012), nearly the same percent of Facebook subscribers (“Internet Usage,” 2012), and the same percent of active Twitter users (SemioCast, 2012). The differences in Internet use may be linked to broadband price and performance. According to Budde (2013), the majority of Americans cannot afford the \$50 to \$100 per month for broadband (para. 4). Additionally, there appears to be only five broadband companies that have more than five million subscribers, followed by at least 10 other cable and telephone companies that also provide broadband services, for a total of 80,751,459 broadband subscribers (Malik, 2012). The competitive nature of the industry in the U.S. has not brought the broadband price down. The market dwindles because those who want broadband have already subscribed. In Canada, there are two major Internet service providers (ISPs): Bell and Rogers Communications. However, it appears that regional competitors with these two companies play a role in setting the price point. For example, low-tier (slower uploading and downloading speeds) broadband service is available for \$33 in Quebec, and \$64 in

Nova Scotia (CBC, 2013); however, the average Canadian Internet plan costs approximately \$54 per month (Fairley, 2013).

Apparently, the price of broadband, and not broadband availability, may be a leading factor with the nearly identical percent of Facebook penetration in both countries, and identical percent of active Twitter accounts. It appears from the available data that Americans are creating profiles on social networks, but they do not maintain their presence to same degree that Canadians do. There are perhaps other factors contributing to the lower American participation rate on social networks that do not include broadband price point, but it is beyond the scope of this research to delve into these factors. It is important to note, however, that Canadians appear to be more dedicated to creating and maintaining an ongoing social network presence and that price point and availability of broadband are the most likely contributing factors.

Academia Structure in Canada and the United States

America's large population also supports a much larger postsecondary structure. According to the National Center for Education Statistics (2012), the U.S. maintains 4,495 degree-granting institutions, 1,721 2-year colleges, 2,774 4-year colleges, and 2,247 non-degree granting institutions. Of these institutions, 6,742 (59.99%) are classified as Title IV, which allows them to receive government funding for student aid. According to Knapp, Kelly-Reid, and Ginder (2011), Title IV institutions enrolled 20,966,826 students in the fall of 2009 (p. 7). This accounts for 6.62% of the U.S. population; however, these data do not include student enrolled in non-Title IV institutions.

By comparison, Canada has 1,174,200 university students (Association of Universities and Colleges of Canada, 2011, p. 5) in 97 institutions and 781,000 students (Statistics Canada, 2013) in 130 colleges (Association of Community Colleges, 2013). Combined enrolment accounts for 5.68% of the population, however this represents only institutions that are members of the two associations.

According to the Government of Canada (2013), 87,338 professors are employed in Canadian universities, with 84% working full-time in the field. The government projects that employment trends through to 2020 will remain balanced, with 61% of job openings coming through retirement and another 25% coming from expansion demands. There is a steady pool of Ph.D. graduates to fill these positions although there may be future labour shortages in certain fields of study.

Twitter Use in Higher Education

As a *Faculty Focus* survey respondent queried, “Just because the students do [Twitter] it doesn’t mean that it belongs in higher ed. Who are the educational leaders anyway, the faculty or the students?” (“Twitter in Higher Education,” 2010, p. 16).

Shifting from professor-focused to student-centric education has been a challenge to some professors who prefer to teach by lectures, small-group activities, or a combination of the two. Both methods are one-way communication patterns with professors providing information while students attempt to understand the material or knowledge, but do not have an opportunity to interact with it. As we discovered earlier, digital natives do not usually learn best when they are passive receivers. Interactive and engaging learning will most likely occur when using technology to aid with understanding new information and the application and integration of the knowledge.

According to Dawley (2009), student communication patterns change when using social networks. For example, the traditional communication pattern is a professor or a medium giving information to students. The SNS communication pattern positions the student as the hub, which maintains interactive, two-way communication with peers, teachers, and experts. Students are not merely receivers of information, but also provide information, thus enabling them to become more self-sufficient and self-directed learners (Dawley, 2009, p. 112). With its worldwide reach, only language barriers and political systems that have banned its use limit Twitter's application in higher education. Thus, SNS can connect learners with a global perspective of topics and provide the opportunity to both synchronously and asynchronously connect learners and educators. For example, Twitter can be synchronously used in a Twitter chat, or it can be employed synchronously when others comment, retweet, or reply to a tweet hours after the original message was sent.

Employing Twitter as a teaching tool must be well planned in the curriculum and the teacher must consistently use Twitter for it to be effective. Dawley (2009) states that "It is important to acknowledge that credibility and expertise in social networking comes from the extent of involvement in the network, including the amount of participation, frequency, and the usefulness of the information provided" (p. 112). It appears that educators must be committed to using Twitter and other SNS and not just experiment with them. This, if true, may dissuade professors from exploring SNS use as a teaching tool because they may interpret it as too time-consuming with a marginal return of results for the effort.

Even educators who are committed to using Twitter may find that many of their students do not use the tool. A respondent to the *Faculty Focus* survey stated, "When I

asked my students if they would like to me start using Twitter, they almost universally said ‘no.’ Instead, they felt it would be more useful to use Facebook” (“Twitter in Higher Education,” 2010, p. 14). This is an interesting comment because unlike Facebook, Twitter will allow users to possess multiple accounts and allow users to be anonymous. Perhaps, many students are unaware of this. Jones et al. (2011) found “that most students see social network sites as their space” (p. 215). Thus, learners may perceive professors’ use of social networks, particularly as a teaching tool, as an encroachment into their personal lives. A respondent to the *Faculty Focus* survey stated, “The students are very resistant to using it [Twitter] and comment that they don’t want strangers reading their posts or trying to tweet them. They don’t seem to get the benefits of networking this way” (“Twitter in Higher Education,” 2010, p. 9). As the respondent noted, some students, and perhaps some professors, don’t understand that the purpose of Twitter is to make public connections with people who have similar interest, much like a BBS in the 1980s. Interestingly, students are not using Twitter as much as some educators believe. Rinaldo et al. (2011) found that only 19 out of 118 students who participated in their study had “lots of experience with Twitter before this course” (p. 197). Rinaldo et al.’s findings suggest, “Student resistance to using Twitter is a primary barrier to student adoption. Therefore, creative methods for convincing students of Twitter’s benefits early may help pique students’ curiosity” (p. 202).

While some people choose to follow friends and family, educators who use Twitter tend to have a professional account and some may also have another account for family, friends, and noneducational connections. But it is not just the students who are reluctant to use Twitter. As previously noted, the majority of front-end Boomers have

similar sentiments and do not want to use SNS for professional purposes.

In contrast, Dunlap and Lowenthal (2009) found that Twitter creates supportive learning opportunities outside of the classroom. Their example is, “A student is reading something in the textbook and has a question about the chapter. ... She immediately tweets her question to the Twitter community and gets three responses within 10 minutes” (p. 131). Two replies were from classmates. Clearly peer support of learning could be found in the learning management systems (LMS) such as Blackboard and Moodle, but these environments are not native to students and may be perceived as too formal of an environment.

Dunlap and Lowenthal (2009) recognized the importance of using Twitter to support eLearning, and wrote several teaching tips for educators. They saw Twitter as a tool to “encourage free-flowing just-in-time interaction” for online courses (p. 129) and a “way to extend the instructional power of an LMS” (p. 132). They provided six instructional benefits, including addressing student issues in a timely manner, encouraging concise writing, learning to write for an audience, connecting with a professional community of practice, supporting informational learning, and maintaining ongoing relationships (p. 133). While many of these tips concentrate on student use, two in particular are for educators: Addressing student issues in a timely manner, and connecting with a professional community of practice.

With many tweeps are drawn to the SNS tool to look for and share information, it is not surprising to discover that adult learners are using Twitter to augment their learning opportunities. Junco et al. (2010) examined how Twitter can be used in higher education to engage students. The 125-student sample revealed “that students and faculty were both

highly engaged in the learning process in ways that transcended traditional classroom activities” (p. 119). This study indicates that some students and professors want to engage using tools not traditionally used in the classroom. This offers hope to professors who want to move forward with new techniques and use social networks and perhaps other emerging technologies in education.

Mishra, Koehler, and Zhao (2007) found that

Most faculty members in higher education gained their knowledge and skills without educational technology, or at a time when educational technology was at a very different state than it is today. It is not surprising that many do not necessarily see the value of using technology for teaching, consider it irrelevant to good teaching, or see themselves as insufficiently prepared or skilled to use technology. (p. 3)

It is logical to return to the generation differences between students and faculty, but Mishra et al. are clearly expressing that faculty have not stayed abreast of changes in technology, including SNS, and that some faculty believe that there is no need to upgrade or change their teaching styles. Jones et al. (2011) found that resistance to using SNS might be because the rules and boundaries between students and faculty change from a professional relationship into a personal relationship. One interesting statement made by a teacher, which pertains to Facebook use, is “you cannot be friends with someone you grade” (Jones et al., 2011, p. 212). While this may be true for Facebook, as mentioned previously, tweeps can have multiple accounts, thus keeping a defined boundary between social and education, public and private, while minimizing the legal and ethical ramification of using SNS in higher education.

Jones et al. (2011) discovered that “Some respondents were particularly concerned regarding the shifting nature and changes in popularity of social network sites ... and lecturing staff with low information and computer technologies (ICT) confidence may thus be forced to change their usage to coincide with current trends” (p. 214). This reinforces Mishra et al.’s (2007) belief that “any attempt to keep educators up to date on the latest and greatest hardware and software (especially if it focuses on specifics), is doomed to created outdated professionals” (p. 3). Seemingly some educators are fatigued with learning new technologies, implementing them, and then seeing either the technology significantly change or replaced by the institution for more current or updated versions. One respondent to the *Faculty Focus* survey stated:

I have gone through 3 email systems, Blackboard, Moodle, etc. If I thought Twitter was a keeper I would use it. However, I don’t want to learn another system just to throw the knowledge away in a year or 2. (“Twitter in Higher Education,” 2010, p. 15)

This fear of change and technology fatigue may be justified as SNS are constantly evolving with upgrades to be innovative, differentiate, meet user demands, or remain competitive.

While the SNS landscape continues to evolve, Twitter proceeds to have a growing influence on educators, to the extent that the London School of Economic and Political Science created a guide for educators titled, “Using Twitter in University Research, Teaching and Impact Activities” (Mollett, Moran, & Dunleavy, 2011). This indicates the increased interest among faculty to use Twitter as more than just a teaching tool and it also illustrates the need for faculty guidance when using Twitter in academia. It appears

that the use of Twitter and other SNS is influencing how some faculty teach. According to Dawley (2009), to successfully implement an SNS as a teaching and learning tool, “a teacher must become a facilitator, in the network, integrate these tools into their teaching, and learn to model, facilitate, and assist students in the successful use of networks to achieve learning goals” (p. 112). Using SNS compels professors to go beyond lecturing, lab work, and in-class group activities. Indeed, an educator becomes a solid connection to the material, which becomes fluid information as learners discover new knowledge that can complement, refute, or change the meaning of the initial information. Professors who use SNS as teaching tools must be open to challenges from the students, have a thorough understanding of the material, and have some degree of increasing competence when using the chosen SNS. Twitter is a relatively simple SNS that does not require much time to learn; however, it does take time to monitor and correspond with students. The amount of time needed to engage students on Twitter appears to be a concern of faculty who have tried Twitter, but no longer use it. In a *Faculty Focus* report (“Twitter in Higher Education,” 2010), a number of respondents stated that they did not have time for Twitter and that Twitter was not a good replacement for email:

- I will only use it if I have to and email goes away (p. 16).
- There are too many places I need to check daily and this was just another place (p. 19).
- I respond promptly to all student correspondence no matter what the mode. I do NOT have time to deal with Twitter (p. 19).
- I have not found a use for it that is better than email which I use extensively ... I have 40-50 emails/day. Professionally, why would I need mini-emails like tweets

too? (p. 19).

- It's really not valuable for getting any kind of information across. And anything you could put on a "Twitter feed" is more reliably transmitted via email (p. 20).

Time is clearly a motivating factor for not using Twitter, but there also appears to be a misunderstanding about how to use the tool. Twitter was not designed to usurp email, but to share small pieces of information and to connect with others who have similar interests. As a byproduct, it may also be used to augment teaching and learning practices. If there is a misunderstanding about how to use Twitter in higher education, the cause may be in how Twitter is perceived to fit in to the curriculum and is used to provide support for learners outside of the classroom.

Remaining Current with Professional Development

As a *Faculty Focus* survey respondent remarked, "I've reached more people and have had more exposure as an academic tweeting and blogging about higher ed than I have ever with my more traditional research and publishing" ("Twitter in Higher Education," 2010, p. 8).

Professors' primary responsibilities are teaching, research, and service in the institutional community and beyond, such as volunteering for advisory boards. It remains the responsibility of each professor to maintain currency with the knowledge base within his or her area of specialty and with education practices. In the realm of SNS, gaining PD knowledge goes beyond attending nonmandatory faculty workshops, reading, and attending, presenting, and networking at conferences. Technology progresses at such a rapid pace that educators are hard pressed to stay current, especially with application of technologies in education.

Mundy, Kupczynski, Ellis, and Salgado (2011) acknowledge that each professor is a subject matter expert who “ dedicates his or her life to learning everything possible about an area of interest” (p. 2), and that he or she is equally dedicated to knowing, understanding, and implementing teaching practices (p. 2). Thus, they argue, educators need to stay relevant through professional development to understand how to teach and become “a true educator” (p. 2). Munday et al. indicate that professors are motivated to uncover and understand as much about their area of specialization as possible and it is this natural motivation that has led some educators to use Twitter in search of specific information and professional growth.

Who Is Using Twitter?

While that vast majority of faculty are aware of Twitter, not all professors find Twitter useful. A 2010 study conducted by *Faculty Focus* found that 47.9% of the 1,372 higher education professional respondents have never used Twitter (“Twitter in Higher Education,” 2010, p. 5). Of the 35.2% of respondents who were current Twitter users at the time of the survey, 71.2% either occasionally or frequently use Twitter to share information with peers (“Twitter in Higher Education,” 2010,p. 5). While these numbers seem impressive, upon closer examination only approximately 25% of the participants in the study used Twitter both frequently and occasionally to connect with peers, which is much lower than Veletsianos’s (2012) finding that 39% of educators in his study use Twitter to share information (p. 342). These figures should give pause for thought when compared to a recent research release by the Pew Research Center (2012a), which found only 15% of Internet users use Twitter and only 16% of Twitter users have graduated college or university (p. 15). Together these numbers may indicate that a large proportion

of educators are not using Twitter for PD, even though there are a number of articles (Dobler, 2012; Ferguson, 2010; Gerstein, 2011; Greenhow, 2009; Mundy et al., 2011; Veletsianos, 2012) that support and encourage using Twitter as a professional development tool. Not surprisingly, there is little if any research conducted solely about why educators are not using Twitter for PD. Although there are a growing number of educators using Twitter, its use for professional development is not conventionally used in higher education.

Twitter provides a technology platform for educators to personalize their learning by sharing ideas, concerns, triumphs, and failures with others. Twitter also provides networking opportunities, which were previously relegated to conferences. Recent research by Veletsianos (2012) indicates that 39% of tweets in the research data set were “sharing information, media, and resources [and] was the dominant activity of the scholars’ participation” (p. 342). This indicates that educators are engaging with each other on Twitter to share knowledge that could augment traditional PD-upgrading practices and provide them with information that is in their field of study or teaching specialty.

Warlick (2009) warns that tweets are only shared inside of a group and while the tweets may be useful, they do not always travel beyond the PLN. He states “Learners become amplifiers as they engage in reflective and knowledge building activities, connect and reconnect what they learn, add value to existing knowledge and ideas, and then re-issue them back into the network to be captured by others through their PLN” (p. 16). To discover whether this is indeed true, research should be undertaken to discover the reach of tweets. One means of discovery could be to find out how many followers the average

Canadian professor has. This will provide an indication of how many people are seeing the tweets, but will not take into account who or how often the original tweet is retweeted.

With only a small number of professors actively engaging on Twitter, it is important to discover how they use it and what value they gain from using it.

How Professors Use Twitter

As Twitter slowly gains a foothold in professional development, educators are finding new ways to use the tool. Carrigan (2012) supports Twitter use in academia, but acknowledges that, “Twitter has an image problem” (para. 2) and believes some of the perceived issues in academia are:

1. Inadequacy of ‘micro-blogging’ as a concept (para. 3);
2. Terminology, interface, and minutiae of Twitter are inherently confusing until you are engaged with the service (para 3);
3. The somewhat steep learning curve is not a very attractive proposition to time-poor academics (para. 3);
4. Twitter offers no *real* tools to control who follows you is a source of concern for some academics (para. 6).

Even with such drawbacks, there are tools available to help professors navigate and use Twitter in the key areas that professors need professional development. A list of 100 ways educators could use Twitter was created by Dunn (2012a), which included themes such as research, conferences, collaboration or sharing, and increasing personal brand exposure.

Research. The majority of researchers may begin their search for information at

the university library. This norm is now being challenged as some professors are turning to Twitter as a source of finding and disseminating information. Finding information is as easy as typing a key word into the Twitter search box. This search may provide valuable leads to the most current nonpeer-reviewed articles. The search may also lead to peer-reviewed articles, but that is not the norm. The most proficient means of using Twitter to find information is to create a hashtag stream. This can be done in two ways: following a stream or following a chat. For example, if a professor is looking for information about social media use in education, a stream with the hashtag #SMinEDU should be followed. Many subjects of interest also have scheduled live chats. The chat for social media use in education is #smedu. Following a chat stream even when the chat is not taking place can be an excellent source of information as others continue to post links and share thought with others who are involved with the chats.

Using Twitter for research is not limited to gathering articles or finding knowledgeable experts in the field. Twitter is also used to find participants for research studies. These tweets often provide hashtags for a stream, such as #elearning, and a chat (#edchat) that are both relevant to the study. It is difficult to discover the number of researchers who use Twitter to find participants.

Conferences. Similar to using Twitter for research purposes, hashtags are the key to using Twitter at conferences. For some professors, conferences provide them with the opportunity to solidify Twitter network connections, to participate in conferences, and to join in if they are unable to attend. Networking at a conference is fairly easy, even for professors with a small number of followers. Many conferences use a specific hashtag, such as #DevLearn. Following the hashtag stream allows people to find other like-

minded people, and even a simple tweet such as “@user’s_name. I’d like to learn more about your interesting concept. Can we meet after the seminar to chat about it?

#ConHashtag” can result in a stimulating conversation. Following the hashtag stream can also help conference attendees discover others who they may wish to follow. The value of finding and corresponding with other professors is invaluable, as it will later give the professor the ability to collaborate and share PD information.

Attending the various seminars and presentations also provides the opportunity to use Twitter to share information otherwise not available. Some tweeps will tweet out key messages or learning points from seminars. If the conference hashtag is used, others in the room may start a conversation about a certain tweet that may even extend beyond the time allotted for the presentation. This provides shared insights into topics and the opportunity for reflection on the opinions of other people. However, tweeps do not have to be in attendance to participate in Twitter hashtag conference stream. Anyone may follow the hashtag and also tweet comments. Some conferences provide a screen where the tweets are projected for both the audience and the presenter to see. This allows both attendees and people unable to attend to ask questions, gain knowledge, and participate in the presentation.

Collaboration and sharing. Twitter has attracted a large number of educators who are actively engaged with each other and trade teaching tips, participate in chat rooms, and share experiences. The exchanges of tweets for educators can, theoretically, improve knowledge and practice, including bringing new technologies and teaching techniques into the classroom much more rapidly than workshops. According to Bushler, “The time I spend on Twitter or other social media is much more valuable and targeted

because it gives me something I can really use” (as cited in Fingal, 2011, p. 25) compared to traditional means of finding information about PD. Twitter has personalized professional development and allowed professors to gain more knowledge on a 41on-tradition basis about topics they believe can help them grow as educators. This is accomplished using the hashtagged streams and chats. Additionally, Twitter provides a platform where professors are exposed to new trends, techniques, and ideas that have not yet made it into traditional workshop content.

The World Wide Web and social networks have enabled people to reach out across vast geographic expanses and connect with like-minded people. Indeed some educators have felt limited by geography. According to Cooke (2012), the connections made with Twitter “can break the sense of professional isolation that many teachers feel within the walls of their schools while reinvigorating their lesson plans by exposing them to daily global idea exchange” (para. 5). The sense of isolation can occur in small universities where the number of faculty in a given program is small; however, faculty at larger universities can also use Twitter to reach out to faculty at satellite campuses in the university or universities in other provinces, countries, and continents, thus creating a worldwide learning and teaching support system. This global exchange of ideas and theories can provide educators with new information that would otherwise not be found.

Professors and others in education have taken the initiative to create resource lists for educators who wish to create their own PLN. For example, the wiki twitter4teachers (2012) maintains a list of educators on Twitter by specialty, such as eLearning teachers, colleges and university professors, and retired teachers. Resources such as this allow educators to follow their peers, as well as follow others in different education niches for

research or personal interest reasons. Another example is the Blumengarten's (2012) education resource website, which includes one web page dedicated to a list of hashtags and education chats. Such lists and web pages are necessary for educators to quickly build a PLN because Twitter does not provide such information. Indeed, there is a noticeable lack of research published on PLNs for educators.

Lepi (2012) published a list of over 300 educational Twitter hashtags and it is not inconceivable that the list, if updated, would continue to grow. The hashtag list is complemented by Dunn's (2012b) list and brief descriptions of 50 education chats, including some for higher education, education technology, and a variety of other education-related topics. These two resources indicate that using Twitter is a popular means of communication between the various stakeholders in education, including educators and students.

Branding. The rise in popularity of SNS has also increased the awareness of personal branding. Much like a product, some professors are using SNS to create awareness of their knowledge, their research, and their expertise. Dr. Rey Junco, for example, uses his blog, his Twitter feed, Facebook, and Academic.edu to connect with others about his area of specialization, which is SNS use. He provides links to his published research papers, shares information about SNS use, and tweets about conferences at which he is speaking. In turn, these efforts increase his value as speaker, as a researcher, and his overall value to professional development.

Summary

Twitter for professional development is a valuable tool to those who have put in the time and effort to build a workable PLN; however, Twitter clearly has its faults,

which can be difficult to both overlook and overcome. While the usefulness of Twitter in higher education is still debatable, we have at least discovered that there are number of professors who are leveraging SNS to move their PD forward and experiment with using 43on-traditional methods for engaging their students.

CHAPTER THREE: METHODOLOGY

This research was conducted to gain insights into how professors at a medium-size Southern Ontario university use Twitter as a teaching tool and for professional development. This section begins with the examination of the methodologies used in similar research. I then justify why I have chosen to use both qualitative and quantitative methods followed by a description of the pilot studies. I then turn my attention to explaining the quantitative methods in detail, including the participants, sample procedure, surveys, and the data collection process. Next, the relevant information about the qualitative method used in this research is provided. An overview of the various frameworks is then illustrated in conjunction with variables explored in this study. The chapter concludes with assumptions made about the data, limitation of the methods chosen, and an outline of ethical considerations.

Research Methodology and Design

This study employed mixed methods research using a combination of an online survey and face-to-face interviews and appears to be the first Twitter research conducted that uses both qualitative and quantitative methods. The majority of studies on Twitter use in postsecondary education focus on student use of Twitter and not how faculty use Twitter. Several studies have used quantitative methods in an attempt to uncover how faculty use Twitter (Ebert-May et al., 2011; Malesky & Peters, 2012; Social Media Usage,” 2011; “Twitter in Higher Education,” 2010) and even fewer studies have interviewed faculty exclusively about their Twitter use, although Lalonde (2011) interviewed Canadian faculty to discover how they employ Twitter to help maintain currency in their subject discipline but did not delve into using Twitter as a teaching tool.

Other studies have included content analysis of faculty tweets (Veletsianos, 2012). Mixed method research on Twitter use by professors has yet to be conducted in Canada.

Additionally, TAM has not yet been employed to gain a foundation of understanding of social network use, particularly in Canada.

Pilot Study

A pilot study of the survey was conducted by asking four professors to fill out the online survey. Each professor was provided with a Word document that contained questions about the clarity of the survey, which they were asked to read prior to going online. Participants were asked to answer the questions after they had completed the survey. The following questions were asked about the survey construction:

1. Were there any questions that appeared unclear? If so, please indicate the survey question number and explain what was unclear.
2. Were there answers to questions that did not offer you the answer choice that best reflected your preferred answer? If so, please indicate the survey question number and how you would have preferred to answer the question.
3. Were there any questions that appeared to be redundant? If so, please provide the survey question numbers.
4. Were there any questions you felt uncomfortable answering for personal reasons? If so, please provide the survey question numbers.
5. Do you feel that any questions were leading you to a specific answer or away for specific answers? If so, please provide the survey question numbers.
6. Were the survey instructions clear? If not, please indicate which instructions were unclear.

Prior to participating in the pilot, participants were informed “This is a study of how professors at a medium-size Southern Ontario university use Twitter as a teaching tool and for finding and/or sharing information about the professor’s subject discipline/educational practice.” In consideration of the participants’ time, I spoke with them by either telephone or Skype and created a written summary of their observations and suggestions. Participants stated that all survey questions were relevant to the study based on the above statement, and that professors, regardless of faculty affiliation, would understand the questions.

Suggestions for improvements that were acted upon include removing one question because it was leading, clarifying instructions, adding a response choice to one question, and on two questions, shortening the selection choice to 10 and 12 respectively, and inserting an “Other, specify” open-ended selection. Finally, one question was moved to appear later in the survey as it was deemed intimidating by two pilot study participants.

Site Selection and Participants

An invitation to participate in the online survey was emailed to 28 of the 54 department chairs at the university. The departments that were not contacted did not identify or provide contact information for chairs on the department website. Chairs were asked to forward the survey invitation to all professors within the department. It is unknown how many chairs forwarded the invitation to professors, but nine chairs replied to the email stating they had forwarded the invitation. The researcher expected approximately 55 professors, or 1% of sample population, to complete and submit the survey. According to McBurney and White (2007), surveys printed in magazines have the lowest response rates of 1% or 2%, while surveys mailed to the sample population have

the second lowest rate at 10 % to 50% (p. 246). Little research has been conducted on acceptable response rates for online surveys; however, Roster, Rogers, Hozier, Baker, and Albaum's (2007) research found that mail surveys have a 13.2% response rate and web/Internet surveys garner a 7.1% response rate (p. 139). This appears to indicate that response rates of web surveys are compatible with surveys printed in magazines. Because of some professors' negative preconceived notions about social networks and Twitter in higher education, it was decided that the study would go forward with participation of at least 15 professors. Prior to commencing the research, the researcher decided to resend the invitation email 6 days before the end survey period as an attempt to increase the number of responses.

The final survey asked for interview participants. Four professors at the university indicated they would partake in the interview portion of the research, but only three were available for interviews. Interviews took place in each professor's office at the university and were conducted over the course of 2 days at the university.

Prior to commencing the interviews, the interviewee was provided with a consent form that stated the interviewee could decline answering any questions. In the informed consent form, participants were also informed that they could ask the interviewer to stop the interview at any time. Each interviewee was asked seven questions and each interview took approximately 30 minutes. At the conclusion of the interviews, the interviewees were asked to contribute any other thoughts about Twitter in higher education.

Instrumentation

Two instruments were used to gather data: an online survey and interviews. The 28-question survey was developed based on the adjusted technology acceptance framework and the research questions. The survey (Appendix A) employed closed-ended and ordinal scale questions except for three open-ended questions and one question that asked for interview participants. The survey was pilot tested and necessary adjustments were made to word selection, including clarity, brevity, biased or misleading questions, answer selections, and the organized flow of the questions.

The instruments were based on the theoretical frameworks. TAM introduced perceived usefulness and perceived ease of use while the UTAUT theory found that age, gender, experience, and voluntariness of use impact performance expectancy (perceived usefulness), effort expediency (perceived ease of use), social influence (peer expectancy of use), and facilitating conditions (organization and infrastructure of support). Salajan et al. (2011) also added peer influence and perceived quality of teaching to technology acceptance, and although the findings were inclusive, I believe that both factors are important enough to include in this study. Combining TAM, UTAUT, and Salajan et al.'s work creates an impressive list of factors that can be combined to create a framework against which the findings of this study will be measured; however, measuring voluntariness of use is not applicable as Twitter is not a university-prescribed technology. As illustrated in Table 1, this study will measure the number of years each professor has taught in postsecondary education (years of instruction) as opposed to measuring the professors' age. Years of instruction and gender can be aligned so that the data collected in this study may indicate whether these variables are either influenced or have an

Table 1
Frameworks

	TAM (1989)	UTAUT (2003)	TAM for Faculty (2011)	Symmons (2013)
Perceived usefulness	√		√	√
Perceived ease of use	√		√	√
Performance expectancy		√		
Social influence		√		
Effort expectancy		√		
Organizational support		√		√
Gender		√		√
Age		√		
Experience		√		
Voluntariness of use		√		
Peer influence			√	√
Perceived quality of teaching			√	√
Years of teaching				√
Peer support				√

influence on perceived ease of use, social influence, university support, peer support, and perceived quality of teaching.

The semistructured interview contained seven questions (Appendix B) that were based on the research question, which focused on what motivates or de-motivates faculty from using Twitter. Interview questions were field tested on the two thesis committee members and feedback was provided pertaining to word selection and the organized flow of the questions.

Data Collection and Recording

Survey data for both the pilot survey and the final survey were collected through Fluid Survey. An invitation to participate in the survey was sent to 28 department Chairs asking them to distribute the invitation to participate to professors in the department. At least nine Chairs forwarded the invitation to professors in their departments. The survey was available online for 21 days. On the 15th day, a reminder to participate was sent to department Chairs. During this period, the researcher received four emails from survey respondents who indicated interest in participating in an interview. Unfortunately, scheduling conflicts for one interview participant resulted in only three interviews taking place.

The interviews took place over 2 days and all interviews were audio recorded. The recordings were transcribed the day after each interview and all transcriptions were completed 3 days later. The entire data collection period was 23 days plus 3 days for transcription.

Quantitative Data Processing and Analysis

The survey data were retrieved from Fluid Survey and uploaded into Statistical Package for the Social Sciences (SPSS) version 21. Interpretations of the data set included descriptive statistics of the demographics. The descriptive statistical analyzes of variables, such as the perceived ease of the four social networks and how professors use Twitter, were conducted to provide mean, modes, and medians for each survey question.

Qualitative Data Processing and Analysis

Thematic analysis was conducted on the qualitative data following Braun and Clarke's (2006) six phases of thematic analysis. The interviews were transcribed and then checked against the audio recording for accuracy. All references to personal names were removed from the transcripts. Transcripts of the interviews were emailed to two education students enrolled in a master's program who are also employed in adult education. These students were provided a brief description of the research, including the title of the paper. With this in mind, they were asked to examine the transcripts for what they believed to be perceptions and motivations of Twitter use and whether these were positive or negative perceptions and motivations. Each student, along with the researcher, followed Braun and Clarke's first two of six phases of the thematic analysis process. The first phase requires familiarizing oneself with the data by reading, rereading, and noting initial ideas about the data. In the second phase, the students and researcher noted all "interesting aspects in the data items that may form the basis of repeated patterns across the data sets" (Braun & Clarke, 2006, p. 89). The researcher finished the second phase by collecting the data from the students and compiled the notes and codes. During the third phase, the researcher identified broad themes and distributed the data notes and codes

into the themes. Phases four and five occurred simultaneously as the themes were reviewed a number of times while the names and definitions of themes evolved. At the conclusion of this phase four, themes were identified: general Twitter, Twitter and students, Twitter and professors, and other technology. Each theme had several subthemes. The subthemes of general Twitter are general use, positive experiences, negative experiences, and private versus public. The subthemes for Twitter and students are barriers to student use, and Twitter use with students. The subthemes for Twitter and professors are subject discipline and filtering information. The subthemes for other technology are general attitude, use of technology, email use, Facebook use, LMS use, and professors' information/technology overload. The final phase of the thematic analysis is producing the report. This investigative triangulation method improved the validity of the inductive analysis.

Methodological Assumptions

A number of assumptions about the data may have an impact on the outcome of the research findings and recommendations. It was assumed that the interview and survey participants understood each question and that they knew the answers to the questions. It was further understood that they might encounter difficulties answering the questions because they were unaware of their feelings, perceptions, and judgments about Twitter use prior to being asked the questions. Upon reflection, it was assumed that participants provided thoughtful information based on their personal experiences, attitudes, and behaviours. Because of the nature of the topic, some participants may have been self-deceived and believed they are more technologically savvy than they truly are. It is also assumed that participants are willing to accept the answers they provide. This may be

more evident in the interviews because the participants may not have wanted to be judged by the interviewer as not as fluent in technology as other participants; however, it is assumed that the participants were providing their honest opinions and not intentionally deceiving or misrepresenting their abilities, motivations, or perceptions. Finally, it was assumed that participants were providing opinions about their perceived use of technology and not their actual use of technology.

Ethical Considerations

The university's research ethics board cleared this study (file number 12-183-ENGEMANN). The researcher's name and email were provided at the end of the consent form and at the conclusion of the survey. Interview participants were given consent forms, which they were asked to complete prior to the interview. Survey participants were guaranteed anonymity unless they accepted the invitation to be interviewed. These individuals provided their university email address, which contains either their full name or their last name. The researcher guaranteed these individuals confidentiality and upon receiving their email addresses, the researcher entered this information in a database and removed the email address from the survey response. This mitigated the risk of aligning the individual with the completed survey.

Although the risk of these situations is low, participants could feel embarrassed, worried, or emotionally stressed because talking about their inability to use technology can be emotionally challenging. This has a more likely possibility of occurring in the interview section of the research because of the face-to-face interaction. The participants were notified at the beginning of the interview that if they felt uncomfortable or uneasy during any part of the interview, they could request that the audio recording be stopped

and they could take a break. During the break, participants could request to leave the room to gather their thoughts, however if they did not feel comfortable going forward with the research, they could withdraw at this time.

Possible participant benefits include the opportunity to express their experiences and perceptions of social network use for teaching and PD purposes. These enabled the researcher to publicize professors' perceptions about the effectiveness of professors' use of Twitter by faculty. This also provided participants with an opportunity to reflect on their current social networking practices, which could help further their understanding of the how new technology impacts their personal teaching philosophy. Participant feedback can be used by faculty to make changes to their curricula and personal learning network practices to better prepare them to use Twitter for teaching and discovering more about their subject discipline. The education community will gain information through these insights to enhance their knowledge about Twitter's impact on postsecondary education professionals.

Summary

This chapter has outlined the research methodology and design, including the selection of participants, instrumentation, and data collection, processing, and analysis. Consideration has been given to the limitations with the study and the ability to generalize the findings to other settings. The next chapter will provide the details of the qualitative and quantitative findings from the research.

CHAPTER FOUR: PRESENTATION OF RESULTS

Social network use is rapidly increasing, with approximately 55.2% of the Canadian population using Facebook (SocialBakers, 2012) and 28% of the population maintaining an active Twitter account (SemioCast, 2012). American research indicates that Twitter use is rapidly increasing with 18-24 year olds (Van Grove, 2012). With the similarities between social network use in Canada and the United States, it is reasonable to presume that Twitter is also gaining traction in Canada. But are university professors adopting Twitter into their teaching practices to search for information about their subject disciplines and discover educational trends and practices or for personal use?

This is an exploratory study to discover the extent to which professors use Twitter at a medium-size Southern Ontario university. This paper attempts to provide a uniquely Canadian perspective on how some Canadian professors use Twitter, provide information about why professors are not using Twitter, and identify benefits and disadvantages of Twitter use higher education. This study will provide insights into how academics are using Twitter to reshape their teaching practices, maintain currency in their subject discipline, and gain further knowledge about pedagogy.

A mixed methods approach to data collection was employed in an attempt to answer three research questions. The first question was, “What motivates professors to use Twitter as a teaching tool and for professional development?” Secondly, it was important to ask, “How do professors use Twitter as a teaching tool and for professional development?” The final question is “What are the de-motivating factors professors have to using Twitter as a teaching tool and for professional?” The research questions were

based on the technology acceptance model (TAM) created by Davis (1989), additions to TAM by Salajan et al. (2011), and the UTAUT theory.

Both full- and part-time faculty members participated in the study. There were two phases to data collection. The first data collection point was from an online survey tool, which garnered 17 completed surveys from 19 respondents, for an 89% completion rate. The survey response rate was 2.9%, but a low response rate was expected due to the subject matter, instrumentation, and the limited contact information of professors. The response rate is above the 1% to 2% response rate expected from magazine surveys, but below the 10% response rate from mailed surveys (McBurney & White, 2007, p. 246). Employing an online survey to collect data was chosen to ensure confidentiality and to reach as many professors as possible in the least intrusive manner. Demographic data, such as number of years teaching, appointment, rank, and gender, were collected in addition to information about the participants' impressions and perceptions about Twitter's ease of use, perceived ease of use, social influence to use Twitter, peer support of Twitter, university support, and the perceived quality of teaching when using Twitter. Study participants were self-selected and the data were self-reported. The online survey contained 28 questions and took an average of 7.5 minutes to complete. The survey remained available online for 21 days and one reminder was sent out on the 15th day. The data were analyzed using the software application Statistical Package for the Social Sciences (SPSS) version 21.

The final survey question asked for volunteers to participate in face-to-face interviews, which was the final phase of data collection. Interviews were conducted over 2 consecutive days at the university with three professors. The purpose of the

interviews was to gain a deeper understanding of what motivates faculty members to adopt Twitter, uncover advantages and disadvantages of using Twitter, and ascertain why some professors are not using Twitter. The data were analyzed using Braun and Clarke's (2006) thematic analysis guide.

This chapter reports the results from the quantitative and qualitative data for the four social networks included in the online survey. Deeper insights into Twitter use are provided in chapter 5. I begin with demographic descriptive statistics and then follow with the adjusted TAM and examine the data against perceived ease of use, social influence, faculty member support, the perceived university support to use and engage on social networks, and finally Twitter's perceived impact on teaching from Twitter users.

Quantitative Data Findings

The quantitative data of this exploratory study re used only for descriptive purposes. No *p* values are assigned and as the data are not normally distributed and therefore nonparametric, *z* scores are not provided.

Demographic Descriptive Statistics

The survey garnered 19 responses from a faculty population of 583, for a 3.5% response rate. However, one respondent completed only the demographic questions and another respondent completed the demographic questions and three additional questions. These two responses were substantially incomplete and deemed unusable for analysis, resulting in a 2.9% response rate, or 17 of the 19 surveys used for data analysis. Table 2 provides the demographic data of the survey respondents.

Table 2
Demographic Data of Survey Respondents by Gender, Rank, Appointment, and Years of Teaching

Teaching experience (years)	Gender		Rank				Appointment			
	Female	Male	Professor	Associate professor	Assistant professor	Lecturer	Tenured	Probationary	Limited-term	Part-time/contract
< 1	0	0	0	0	0	0	0	0	0	0
1 - 2	1 (5.9%)	0	0	0	0	1 (5.9%)	0	0	0	1 (5.9%)
3 - 5	2 (11.8%)	0	0	0	1 (5.9%)	1 (5.9%)	0	1 (5.9%)	0	1 (5.9%)
6 - 10	3 (17.6%)	1 (5.9%)	0	2 (11.8%)	1 (5.9%)	1 (5.9%)	2 (11.8%)	2 (11.8%)	0	0
11 - 15	0	3 (17.6%)	0	3 (17.6%)	0	0	3 (17.6%)	0	0	0
16 - 20	3 (17.6%)	0	1 (5.19%)	2 (11.8%)	0	0	3 (17.6%)	0	0	0
21 - 25	1 (5.19%)	0	1 (5.19%)	0	0	0	1 (5.19%)	0	0	0
26 - 30	0	0	0	0	0	0	0	0	0	0
31 - 35	1 (5.19%)	1 (5.19%)	0	1 (5.19%)	1 (5.19%)	0	1 (5.19%)	0	1 (5.19%)	0
> 36	1 (5.19%)	0	0	1 (5.19%)	0	0	1 (5.19%)	0	0	0
Totals	12 (70.6%)	5 (29.4%)	2 (11.8%)	9 (53%)	3 (17.6%)	3 (17.6%)	11 (64.7%)	3 (17.6%)	1 (5.19%)	2 (11.8%)

Data indicate that all respondents have more than 1 year's teaching experience, and 14 participants, or 42% of the sample, have 6 or more years of teaching experience in higher education. Responses to the question "Do you use Twitter?" reveal that 17.6% tried Twitter but stopped using it, 41.2% do not use Twitter, and 41.2% do use Twitter. This tends to support data from the 2011 *Faculty Focus* survey, which found 50.2% of faculty members have a Twitter account ("Social Media Usage," 2011, p. 7) and data from SemioCast (2012) that indicates 17 million people in Canada, or 28% of Canadian population, have an active Twitter account. Combining SemioCast's data to the *Faculty Focus* data points to higher Twitter use amongst professors than the general population.

Motivating Factors

Motivating factors include the perception of Twitter's ease of use, usefulness, the social influence professors may have to use or not use Twitter, the amount of support from both peers and the university, and the Twitter's perceived impact on teaching.

Ease of Use

According to Davis (1989), perceived ease of use can impact how readily people adopt technologies. Davis found "one of the most significant findings is the relative strength of the usefulness-usage relationship compared to the ease of use-usage relationship" (p. 333). As shown in Table 3, participants perceived Facebook, Google Plus, LinkedIn, and Twitter as easy to use. This implies that there are no perceived difficulties with using the interface. There is, however, a distinct difference between Twitter's perceived use and perceived usefulness. When asked how useful participants believe each social network is as a teaching tool, participants indicated that only Twitter

Table 3

How Easy Do You Believe It Is to Use Each of the Following Technologies?

Variable	<i>M</i>	Mode	Median
Facebook	1.41	11 (<i>very easy</i>)	1
Google Plus	1.82	7 (<i>very easy</i> and <i>somewhat easy</i>)	2
LinkedIn	1.41	10 (<i>very easy</i>)	1
Twitter	1.76	8 (<i>very easy</i>)	2

Note. The means and modes are derived from a Likert-type four-point scale (assigned value 1 to 4 respectively): *very easy*, *somewhat easy*, *somewhat difficult*, and *very difficult*.

is believed to be “somewhat useful,” but others were equally not sure about its usefulness, as shown in Table 4.

Facebook and LinkedIn appear to be “somewhat useful” for PD and for personal use by participants. For brevity and the purpose of this study, PD is defined as finding and/or sharing information about a subject discipline and/or educational practice.

Interestingly, participants were “not sure” about Google Plus use for teaching, PD, and personal use, but they indicated it was either “very easy” or “somewhat easy” to use. This contradictory response may indicate that further research is required to better understand how Google Plus is used and perceived in higher education.

Social Influence

Social networks can only operate when connections are made between people who have something in common, such as friendship, professional association, or perhaps subject discipline. It is therefore important to understand how much of influence people have on others when encouraging them to sign up to a social network. Data in Table 5 indicate that faculty members are more often encouraged to use Facebook and LinkedIn for PD and personal use, while Google Plus and Twitter are not encouraged in any of the three areas.

One of the interviewed faculty members supported these findings and stated that she met a secondary teacher and college professor at a social function who both encouraged her to sign up for and use Twitter. Another interview participant stated she began using Twitter after reading about how it was used by project managers to “stay connected” with others in a project. This spurred her to use it to maintain connections with graduate students, especially those not located at the university.

Table 4

How Useful Do You Believe Facebook, Google Plus, LinkedIn, and Twitter is for Teaching, Professional Development, and Personal Use?

Variable	<i>M</i>	Mode	Median
Teaching			
Facebook	3.18	8 (<i>not useful</i>)	3
Google Plus	3.53	12 (<i>not sure</i>)	4
LinkedIn	3.18	10 (<i>not useful</i>)	3
Twitter	2.65	6 (<i>somewhat useful and not sure</i>)	2
PD			
Facebook	2.82	7 (<i>somewhat useful</i>)	3
Google Plus	3.35	11 (<i>not sure</i>)	4
LinkedIn	2.59	9 (<i>somewhat useful</i>)	2
Twitter	2.65	7 (<i>not sure</i>)	2
Personal use			
Facebook	2.06	7 (<i>somewhat useful</i>)	2
Google Plus	3.41	10 (<i>not sure</i>)	4
LinkedIn	2.29	7 (<i>somewhat useful</i>)	2
Twitter	2.71	5 (<i>not useful and not sure</i>)	3

Note. The means and modes are derived from a Likert-type four-point scale (assigned value 1 to 4 respectively): *very useful*, *somewhat useful*, *not useful*, and *not sure*.

Table 5

People Whose Opinion I Value Think That I Should Use SNS for Teaching/Professional

Development/Personal Use

Variable	<i>M</i>	Mode	Median
Teaching			
Facebook	3.18	8 (<i>disagree</i>)	3
Google Plus	3.53	12 (<i>strongly disagree</i>)	4
LinkedIn	3.18	10 (<i>disagree</i>)	3
Twitter	2.65	6 (<i>agree</i> and <i>strongly disagree</i>)	2
PD			
Facebook	2.82	7 (<i>agree</i>)	3
Google Plus	3.698	11 (<i>strongly disagree</i>)	4
LinkedIn	2.59	9 (<i>agree</i>)	2
Twitter	2.65	7 (<i>strongly disagree</i>)	3
Personal use			
Facebook	2.06	7 (<i>agree</i>)	2
Google Plus	3.41	10 (<i>strongly disagree</i>)	4
LinkedIn	2.29	7 (<i>agree</i>)	2
Twitter	2.71	5 (<i>disagree</i> and <i>strongly disagree</i>)	3

Note. The means, modes, and medians are derived from a Likert-type four-point scale (assigned value 1 to 4 respectively): *strongly agree*, *agree*, *disagree*, and *strongly disagree*.

Faculty Member Support

It appears that colleagues and those important to faculty members sometimes encourage social network use, but they do not offer support after signing up to the social network. Results indicate that for all networks involved in this study, with the exception of Twitter, participants found fellow faculty members “neither supportive or unsupportive,” as shown Table 6. The response to Twitter use was either “I do not use this technology” or faculty members were “neither supportive or unsupportive.” This neutrality may indicate that lack of support could increase the number of people who try Twitter but later stop using the social network.

University Support

As with many universities, this Southern Ontario university maintains a strong social network presence. The university’s outreach and communications with the community, alumni, and perspective students does not extend to supporting professors. As shown in Table 6, when asked how much the survey participants believed the university support faculty members’ use of Twitter, 64.7% stated that university was neither supportive nor unsupportive.

Similar responses for Facebook use (70.7%), Google Plus (76.5%), and LinkedIn (58.8%) indicated the perceived neutrality of the university’s attitude towards SNS use by faculty members. When combining the data pertaining to faculty member support and university support, it appears there is little to no support system in place and a lack of training available for new social network users. This perceived lack of support could have an impact on SNS retention rates.

Table 6

How Much Support Do You Receive From Fellow Faculty When Learning SNS for Teaching/Professional Development/Personal Use?

Variable	<i>M</i>	Mode	Median
Teaching			
Facebook	3.06	10 (<i>neither supportive or unsupportive</i>)	4
Google Plus	2.88	9 (<i>neither supportive or unsupportive</i>)	4
LinkedIn	3.53	12 (<i>neither supportive or unsupportive</i>)	4
Twitter	2.76	6 (<i>I do not use this technology</i>)	3
PD			
Facebook	3.29	11 (<i>neither supportive or unsupportive</i>)	4
Google Plus	2.94	9 (<i>neither supportive or unsupportive</i>)	4
LinkedIn	3.35	11 (<i>neither supportive or unsupportive</i>)	4
Twitter	2.71	6 (<i>I do not use this technology</i>)	3
Personal use			
Facebook	3.29	11 (<i>neither supportive or unsupportive</i>)	4
Google Plus	2.94	9 (<i>neither supportive or unsupportive</i>)	4
LinkedIn	3.59	11 (<i>neither supportive or unsupportive</i>)	4
Twitter	2.82	6 (<i>I do not use this technology and neither supportive or unsupportive</i>)	3

Note. The means and medians are derived from a Likert-type six-point scale (assigned value 1 to 6 respectively): *I do use this technology, very supportive, somewhat supportive, somewhat supportive, neither supportive or unsupportive, somewhat unsupportive, and very supportive.*

Twitter's Impact on Teaching

As shown in figures 1 and 2 there was little impact of using Twitter as a teaching tool when examined by years of teaching in higher education and with examining Twitter use by gender.

Of the 17 survey respondents, seven currently use Twitter, three have tried it but no longer use it, and seven have never used Twitter. Current Twitter users were asked, “What impact would not using Twitter have on your teaching?” As shown in Figure 3 only one person (14.3%) responded it would have an “extensive” impact, and three people (42.9%) responded stating it would have “some” impact.

One interview participant stated, “I think that the most important thing is being able to share with my students, and for myself to see those conversations, those discussions, those connections, happening in an authentic manner.” She went on to say that information she disseminates to her students from her Twitter feed, or in the classroom, is often reinforced when her students find similar information on Twitter. Information may also be validated when students go into the field and experience firsthand and “see the implications of theory and see it in practice.”

One interview participant, who tried Twitter but no longer uses it, indicated that she was using other technologies, particularly email and the university's LMS to communicate with students. She did not see the value of using a technology that is limited to 140 characters. Additionally, she saw a disadvantage with having another communication tool that was unnecessary. “I've got the chat [on the LMS] to check. I've all the emails coming in from students. It's like there's a lot going on and it's already very overwhelming.”

Figure 1. Number of Years Teaching in Higher Education and Current Use of Twitter

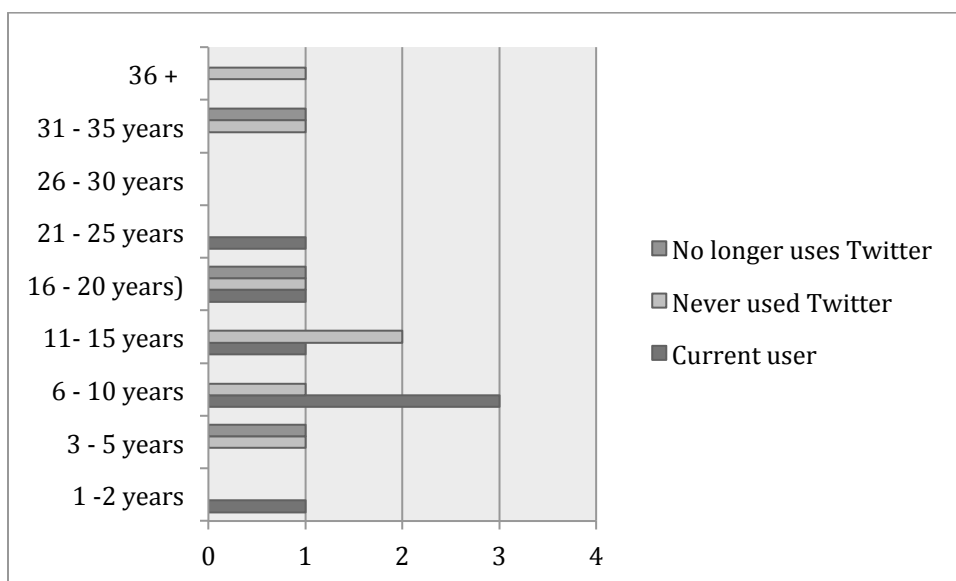


Figure 2. Gender and Current Twitter Use

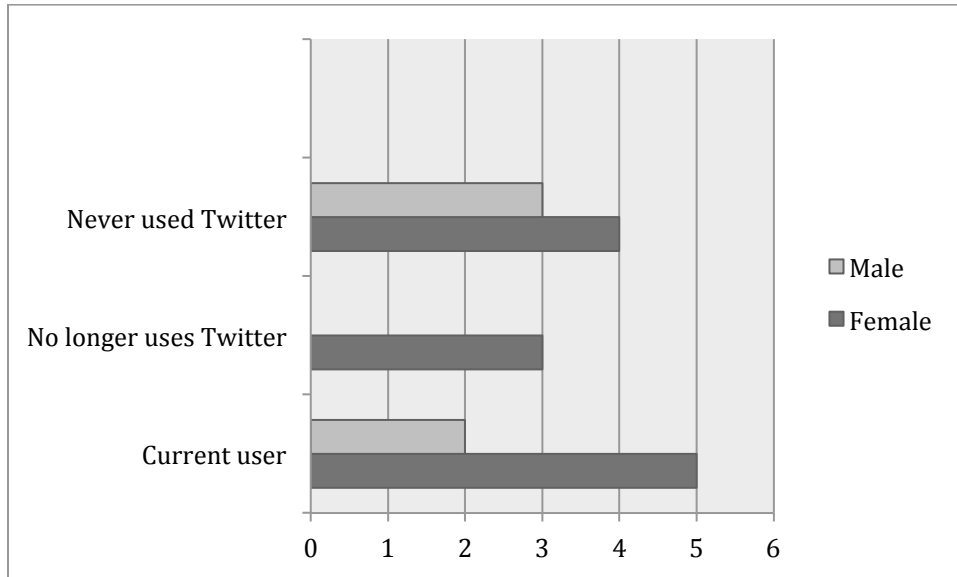
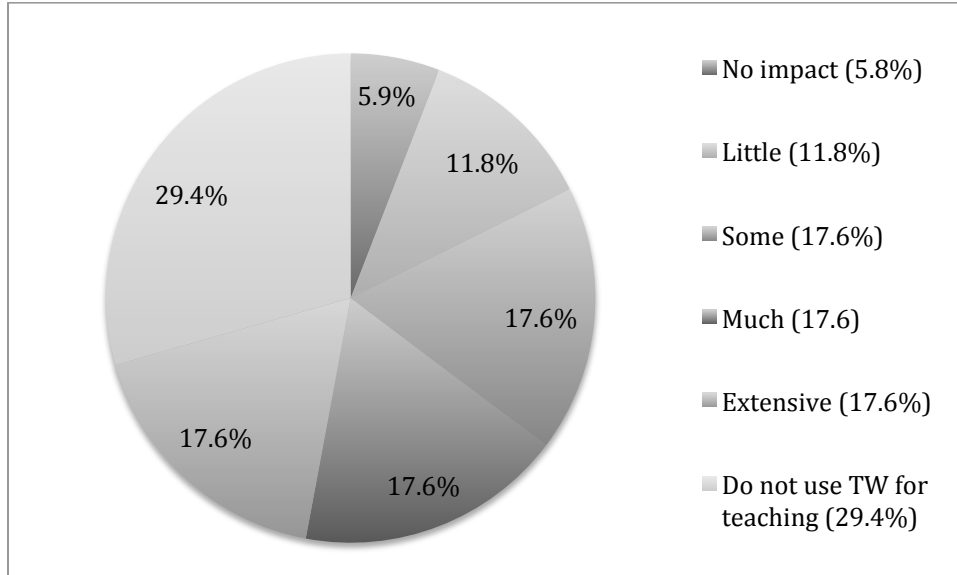


Figure 3. What Impact Would not Using Twitter Have on Your Teaching?



Twitter Users

Seven professors who responded to the survey indicated that they currently use Twitter. Further results indicated that using Twitter as a teaching tool appears to be the least popular use of the social network as illustrated in Figure 4. Interestingly, these professors use Twitter mostly for personal use and to discover more information about their subject discipline. In the realm of professional development, 85.7% of professor indicated they use it to discover more about their subject discipline, while 71.4% indicated they use Twitter to find out more about educational practices. This appears to indicate that these professors are self-motivated to become not only experts in their field, but to hone their skills as educators. Communicating with students was also cited by 57.1% of professors as a useful means of Twitter use.

NonTwitter Users

The seven professors who had never tried Twitter provided a number of reasons for not using the social network, including privacy concerns, questioning its educational relevance, and not wanting to be available to students 24 hours a day. Interestingly, as mentioned above, 57.1% of professors who use Twitter use the tool to communicate with students. There appears to be a discrepancy between the perception of usefulness regarding communication with students who use Twitter and those who have never tried it. As illustrated in Figure 5, the variety of responses may indicate that there is no one predominant reason for not using Twitter, and that professors have a number of concerns that may also be relevant to other social networks or technology use.

Figure 4. Please Indicate how you Use Twitter. Check all that Apply.

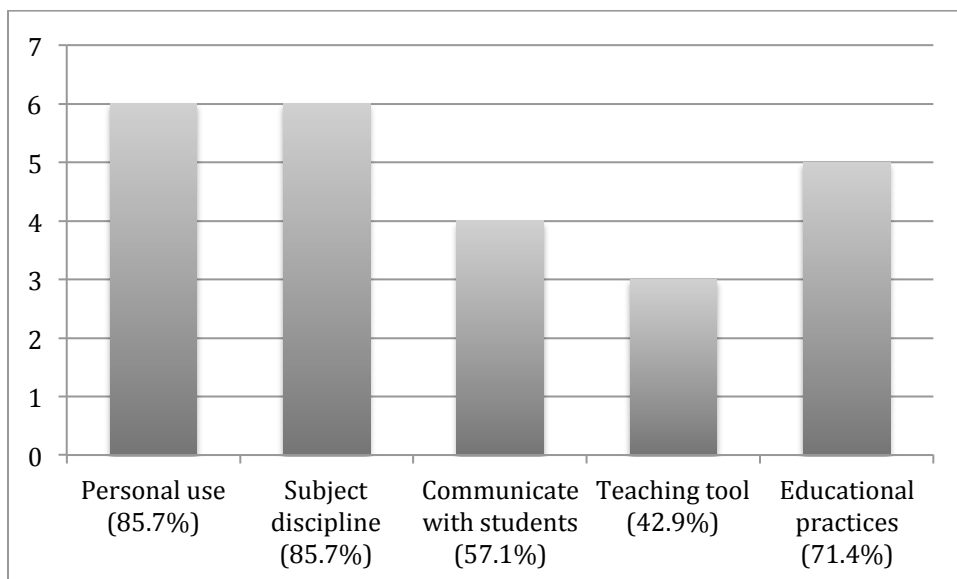
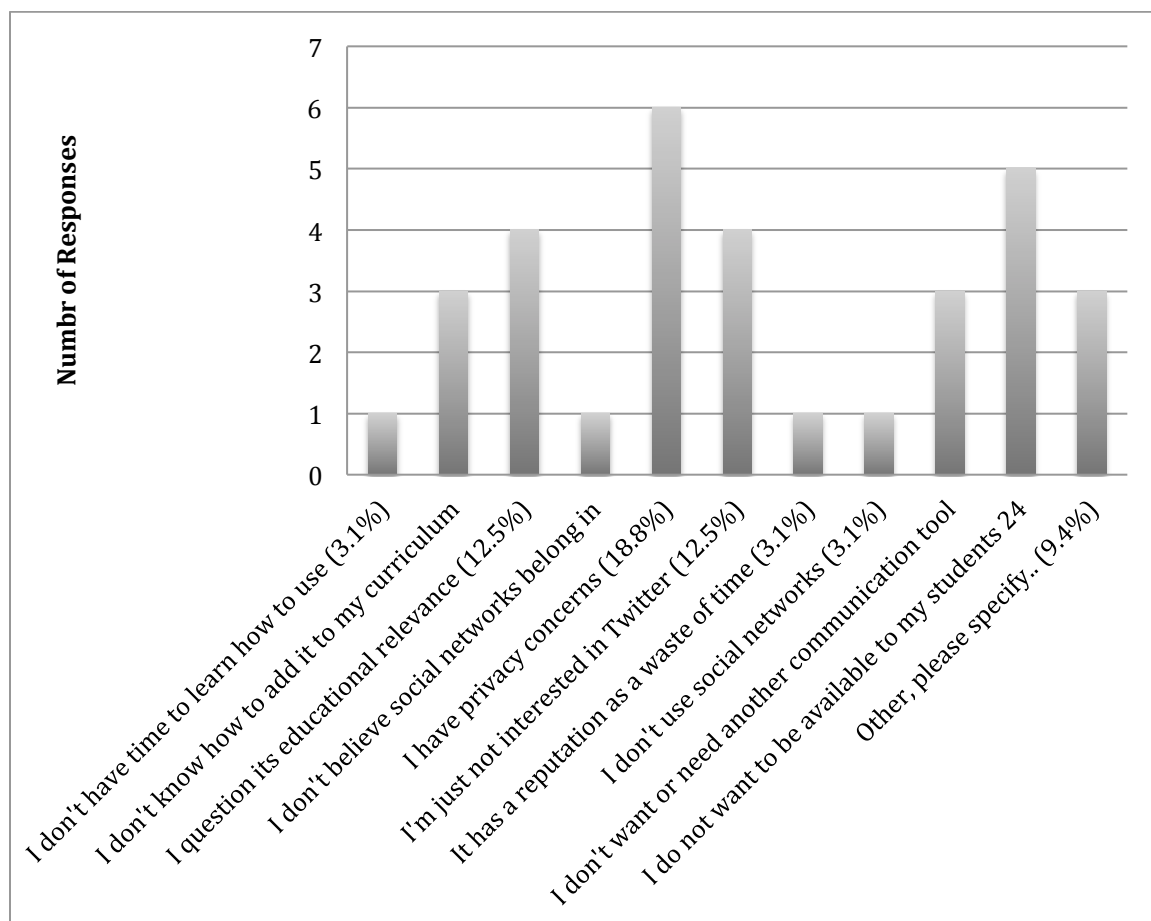


Figure 5. What are your Reasons for NOT Using Twitter for Teaching or Finding and/or Sharing Information About Your Subject Discipline and Educational Practice? (Check all that Apply.)



Interestingly, of the three professors who tried Twitter and no longer use it, there was less variety in their responses, as shown in Figure 6. Not knowing what to post on Twitter as well as not enough colleagues who use the tool were the two main reasons that professors abandon the social network.

Qualitative Themes

Four themes were identified as a result of the qualitative thematic analysis, which were distilled from 14 categories of observation. The four themes are introduced here to briefly present along with the 14 categories of observations. Table 7 illustrates the themes and categories, providing the context for the results and discussion in the following chapter. Interview extracts are then used to illustrate the importance of the themes and categories.

Twitter Experiences

Independent investigators, who were asked to review the interview transcripts and identify main idea and interesting aspects in the data, found that when a professor is encouraged to use Twitter and given examples of how to use it, she or he is more likely to continue using the social network. Willingness to learn, explore, and participate tend to be characteristics of those who continue to engage on Twitter. One interview participant was encouraged to use it by acquaintances who teach at a college and middle school. Another participant read about Twitter use in a journal and began experimenting with its use modeled on the journal description. This indicates that these participants had a positive attitude towards experimenting, to some degree, with technology. This is supported by a professor who started using Twitter, but ceased using it after approximately 1 month. This professor felt intimidated by Twitter and perhaps didn't

Figure 6. Why did you Stop Using Twitter? (Check all that Apply.)

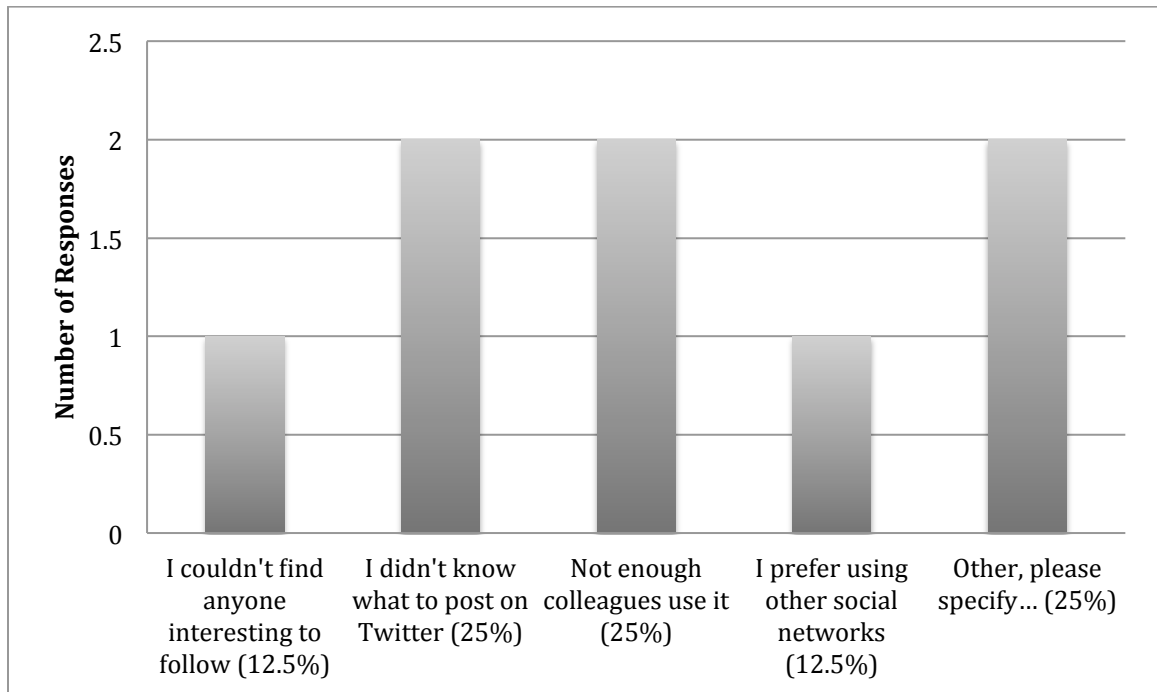


Table 7

Qualitative Data Themes and Categories

Theme	Categories
Twitter experiences	General use Positive experiences Negative experiences Public versus private
Twitter and students	Barriers to student use Twitter use with students
Twitter and professors	Subject discipline Filtering information
Other technologies	General attitude Use of technology Email use Facebook use LMS use Professor information / technology overload

fully understand the different purposes of the various social networks. This professor had heard from others that Twitter could be used as a teaching tool, but did not enjoy using the computer, and therefore, may not have the predisposition to explore how Twitter and other SNS are used.

There were a number of negative and positive comments about using Twitter. Common positive phrases include, “I’m learning a lot,” “it expands the learning experience beyond just the course content,” and I’m “getting more information or getting information a bit quicker.” Negative comments include “I’m already using other [technology],” “I have to start thinking regularly about smart things to say about my work,” “People’s personal and professional accounts or lives overlap,” and “it could be another time waster.”

Although the topic of privacy was mentioned mostly when discussing Facebook, there appeared to be a mild concern from professors that they would have to share too much of their personal lives with students when using Twitter. One participant has four Twitter accounts, including one only for personal use.

Twitter and Students

All interview participants indicated that the majority of their students do not use Twitter. One professor asked a class of 50 students if they use Twitter. Approximately half the students indicated that they did not have a Twitter account. Another professor makes Twitter use mandatory even though few have used Twitter, while another professor believes this is wrong: “If I started adopting Twitter as a teaching tool then I’m obligating my students to also embrace Twitter and I object that that’s been done to me,

and I'm not sure that I want to do that to students." Together, this indicates that the majority of the student population may not be engaged on Twitter.

Some faculty members, however, are communicating with students on Twitter. One professor maintains a list of Twitter names belonging to students she taught over the years. She has created an online community consisting of alumni and current students who share professional resources and help each other when needed. Another professor, who recently started using Twitter, finds information on Twitter and then sends students the links to this information via the university's LMS. This professor sends information that augments the course content or sends information to specific students who have identified a keen interest in a specific topic. Common phases found in the analysis of this theme include "sharing," "connecting," "information," and "relationships."

Twitter and Professors

Professors who use Twitter tend to employ it for two purposes: to find information about their subject discipline and to filter information. One professor noted Twitter has helped her to find "new sources of information that I wouldn't have accessed" pertaining to her subject discipline. This information may originate in the popular media as well as professional or industry journals and from attendees tweeting at conferences. This professor found that information might come to her more quickly through Twitter than through other channels. The speed of obtaining information is reinforced by another professor who states, "It is literally the first place that so much information is posted." Relevant information is obtained by using both people they follow and hashtags. It appears that information retweeted several times is an endorsement of quality. Another filter is the choice of who to follow. Professors indicated

that retweets by trusted sources filters out irrelevant information and reinforces the appearance of a recommendation. Professors also found that hashtags are helpful for finding information, but at times this information may be too broad or not of academic quality. Common phrases professors use to describe how they use Twitter are “information,” “timely,” and “filter.”

Other Technologies

During the course of the interviews, participants named and discussed other technologies they use for both professional and person reasons. Facebook, the university’s LMS, and email were most often mentioned. None of the professors in the study use Facebook professionally. All expressed distrust in Facebook’s privacy settings and all stated that they strive to maintain a boundary between their personal online activity and their professional online activity. One professor stated that she prefers to not know about her students’ personal lives and she didn’t “want to be two clicks from theirs,” which is the purpose of Facebook.

The university’s LMS appears to be a common communication tool; however, one professor stated that LMS use has decreased with increased Twitter and blog use. Another professor has a very positive opinion of the LMS’s chat function and uses it extensively to communicate with students in a public forum.

Two professors indicated that technology use may be reaching a saturation point as too much time is allotted to using and maintaining a presence on various email addresses, social networks, and the LMS. Aside from time constraints, fatigue may also contribute to technology overload. As one participant stated, “How much can you read online in a day without your eyeballs falling out?”

In summary, the findings revealed that participants believe Twitter is easy to use but are not sure how useful it could be either as a teaching or for PD. Additionally, people whose opinion professors value believe that Twitter is an important tool, but the majority did not find this persuasive enough to use Twitter. There appears to be a perception that the university is neither supportive nor unsupportive of professors' use of Facebook, Google Plus, LinkedIn, or Twitter. For professors who do use Twitter, there appears to be little impact of using Twitter as a teaching tool when examined by years of teaching in higher education.

Qualitative data indicate that those who use Twitter use it to learn more about their subject discipline and communicate relevant information to students and colleagues. These participants believe people they are following important sources of good information and act as a filter because these people tend not to retweet irrelevant information. One participant employs the SNS as a virtual community for current students and alumni to share information. While sharing such information may decrease use of the university's LMS, the LMS appears to be an integral means of communication between students and faculty members. All participants voiced their concerns about privacy and maintaining a professional presence as well as the need to keep this distant from their personal use of social networks. Finally, some participants had issues with the amount of technology they are using, which may be an indication that some professors are experiencing technology overload.

The qualitative and quantitative data findings indicate that there may be a place for Twitter in higher education. The following chapter will explore these findings and

discuss suggestions, implications to practice and future research, and provide recommendations.

CHAPTER FIVE: SUMMARY, DISCUSSION, AND IMPLICATIONS

Since the introduction of social networks in the mid-2000s, people have connected with each other to share information, reach out to those with similar interests, discuss topics, and socially interact. One of the most popular SNS is Twitter, which according to Semiocast (2012) approximately 7 million Canadians, or 28% of the population, have an active account. A number of American studies examine Twitter use in higher education (Jones et al., 2011; Malesky & Peters, 2012; “Social Media Usage,” 2011; “Twitter in Higher Education,” 2010), but very little is known about its use in Canadian postsecondary education, and, more specifically, how professors and other educators in higher education use Twitter both professionally and in their personal lives. The purpose of this study was to discover the extent of Twitter use in a midsize Canadian university and to investigate the motives professors have about adopting Twitter and other social networks into their curriculum, professional development, and personal lives. Uncovering how professors use Twitter may help future researchers understand why some professors are quick to try new teaching tools and other professors are more apprehensive. This research attempted to provide a uniquely Canadian perspective on how some Canadian professors use Twitter and provide information about why professors are not using Twitter.

Summary of the Study

This study employed mixed methods research using a combination of an online survey and face-to-face interviews and appears to be the first Canadian Twitter research conducted using both qualitative and quantitative methods. The 28-question survey was developed based on the adjusted technology acceptance framework and the research

questions outlined earlier. An invitation to participate in the online survey was emailed to all professors at the university. Three professors at the university participated in the interview portion of the research. The semistructured interview contained questions focusing on what motivates or de-motivates faculty from using Twitter and how they use Twitter. Thematic analysis was conducted on the qualitative data following Braun and Clarke's (2006) six phases of thematic analysis.

Quantitative findings indicate that professors believe Twitter is easy to use. Participants also indicated that Twitter is perceived to be "somewhat useful" as a teaching tool, but peers and the university do not encourage the use of Twitter. There was little impact of using Twitter as a teaching tool when examined by years of teaching in higher education and with examining Twitter use by gender.

Qualitative results found that when professors are encouraged to use Twitter and given examples of how to use it, they are more likely to continue using the social network. Willingness to learn, explore, and participate tend to be characteristics of those who continue to engage on Twitter.

Discussion

In this section the results are interpreted and examined to understand how and why faculty members employ Twitter, identify and examine barriers to Twitter use, and critically reflect on Twitter practice in higher education. These will be assessed according to the research questions and adjusted technology acceptance model and then compared to the data uncovered through the literature review.

What Motivates Professors to Use Twitter Professionally?

There are no definitive motives in relation to why professors consider using Twitter, which may shed some doubt on Twitter's usefulness as a teaching tool. However, of the 58.8% of survey participant who have tried Twitter, 41.2% remain Twitter users, which indicates that most who use Twitter continue to find some value with the SNS. The two interview participants who use Twitter stated that they particularly value the ability to find information that may not have been discovered otherwise. This appears to be a key reason why some professors continue to use Twitter.

This is supported by Veletsianos (2012), who found that scholars' use of Twitter is predominantly to share information about their professional practices and share information with their students (p. 336). It provides some professors with quick and easy access to sources of current information that include both the popular media and specialized media, including journals and experts' blogs. This allows professors to increase personal learning by reviewing other websites, in addition to enhancing learning while creating self-directed learning opportunities. Learning more about their subject disciplines and educational trends and then sharing this information with colleagues and students was identified as one of the main benefits of Twitter. This is supported by the 2010 *Faculty Focus* survey that found 49.1 % of professors use Twitter to share information with peers and 51.8% use Twitter as a real-time news source ("Twitter in Higher Education," 2010, p. 5).

Another interesting motivator was identified by a comment from an interview participant, who stated, "What I heard was [Twitter] was a great way to increase your student evaluations." This may be a hidden agenda of some professors to use Twitter and

other SNS. Creating a Twitter account for professional purposes and interacting with students might slightly dissolve the boundary between personal and private personas and help students see professors as more than lecturers. This can either positively or negatively affect courses and professor evaluations, depending on how the professor's Twitter presence is perceived by students.

All interview participants indicated that they do not use Twitter as an in-class teaching tool, but instead use it to communicate with students outside of classroom hours to share information. Using Twitter to supplement course material could also expand the students' communication skill and capabilities by incorporating Twitter into their educational practices. In addition to deepening their understanding of the course content, it may also introduce students to the skill of understanding the differences between "good" and "useless" information on Twitter. Sharing information with students in this way is slightly problematic as the interview participants indicated that the majority of students do not use Twitter unless required to, suggesting that perhaps fewer than half the students are receiving additional material that could increase their understanding of complicated topics.

The additional information not only reinforces material presented in class but also allows students to observe how the subject theories are put into practice. One interviewee stated that Twitter helps students "make the connection to the topic in a very authentic manner" because they see the theory discussed in class and then put into practice in the "real world." For professors who foster a student-centric practice, this provides students with the resources, reinforcement, and time needed to reflect on the course content. This

enables students to make connections with previous learning and learning current courses.

The current study did not delve into age and technology experience, but instead combined these factors into teaching experience. The results of the study indicate that neither gender nor teaching experience was a factor in motivating professors to use Twitter. This contradicts Venkatesh et al.'s (2003) Unified Theory of Acceptance and Use of Technology (UTAUT), which states:

The strength of the relationship varies with gender and age such that it is more significant for men and younger workers. The effect of effort expectancy on intention is also moderated by gender and age such that it is more significant for woman and older workers. (p. 467)

It must be noted, however, that university professors have a higher Twitter adoption rate than that of the general population. The UTAUT study was based on data from the general population and examined technology, but not social networks.

De-Motivating Factors Professors Have to Using Twitter

When survey participants were presented with the statement “People whose opinion I value think I should use Twitter for teaching,” 17.6% strongly agreed and 35.3% agreed. This indicates that peers are aware of Twitter and its possible value as a teaching tool; however, any perceived pressure from peers to use Twitter does not transform into action. When presented with the same statement about using Twitter for PD, 29.4% strongly agreed and 17.6% agreed. With a combined 52.9% of participants receiving encouragement to use Twitter for teaching and 47.1% encouraged to use it for PD, it appears that encouragement or peer pressure is irrelevant to these nonTwitter users.

The answer to this situation may be found when attention is turned from encouragement to actual support. Interestingly, when nonTwitter participants were asked “How much support do you receive from fellow faculty when learning Twitter?” respondents showed that none were very supportive and only 29.4% believed faculty members were somewhat supportive when using Twitter as a teaching tool. The numbers are similar when asked about faculty member support for PD, with 5.9% stating that they were very supportive and 23.5% believed faculty members were somewhat supportive. Seemingly some professors are encouraged to try Twitter, but it appears that its usage, and perhaps other social networks usage, is considered a solitary activity and is presumed to be best explored on one’s own. If so, this is ironic because social networks are platforms where people come together to share and help each other. A contributing factor to this is that peers may not belong to the same subject discipline, thus, prospective Twitter users do not have a mentor or Twitter connection with someone they personally know. This is the opposite of Facebook where a community of friends and acquaintances can be strengthened at social events, whereas it is possible for many Twitter users to never personally meet. Participants believe that the university is neither supportive nor unsupportive of their Twitter use so it may be unlikely that they would neither expect nor ask for assistance with Twitter from the university.

As 47.1% of the respondents perceive Twitter as easy to use and 35.3% believe it is somewhat easy to use, professors may hesitate to ask for assistance with the SNS. Posting and sharing information is fairly easy to do on Twitter, and it is little wonder that professors do not ask for help. However, understanding who to follow, where to find chats, how to increase the number of followers, and finding consist quality information to

share can be a challenge for new Twitter users. Interestingly, the lack of awareness about whom to connect with on Twitter and how to make connections appears to be a deterrent to continued use. One interview participant stated that Twitter success might be “just a matter of finding the right people to follow.” Another interview participant stated that not knowing who to follow and the lack of people she knows on Twitter were some of the reasons why she no longer uses the SNS. Perhaps if peers offered to help new Twitter users how to engage and share information there may be more professors using Twitter. This lack of peer and university support combined with the perception that Twitter is easy to use may account for the survey findings that indicate that 17.6% participants in this survey tried Twitter and no longer use it.

With a high perceived ease of use, some professors who try Twitter may quickly discover that they must learn how to use it to their best advantage. If this is not quickly realized, then the perceived usefulness of Twitter may quickly diminish. If this happens, then it is increasingly probable that these professors will not give Twitter a second chance even with peer support.

Additionally, some participants felt that Twitter provided a communication forum that did not add to the value of conversations. “I’m not having the kind of conversations [on Twitter] that I would be having elsewhere,” stated an interview participant. This may be an indication that Twitter is not perceived as a value-added communication tool for professors. Indeed, there may even be too much technology. Two of the three interview participants stated that the time they spend using technology is a de-motivating factor. “I feel like I have so many electronic obligations already,” said one, while another stated, “I think that a lot of my colleagues are thinking that would be way too much time and they

don't have time for [Twitter]." Interestingly, Dunlap and Lowenthal's (2009) feedback on Twitter use included the concern that "Twitter takes too much time" (para. 2). This study found that of the people who had tried Twitter and stopped using it, none chose "It was a waste of time" on the survey as a reason they quit. For those who haven't tried Twitter, only respondent indicated on the survey "I don't have time to learn how to use it." Concerns about time may correspond with Twitter's perceived ease of use. With 82.4% of respondents believing that Twitter is easy to use, they may not be aware of time needed to fully understand how engage on Twitter.

One interview participant indicated that the LMS contained many applications or tools beyond posting course information and using it for email. Chat sessions, virtual office hours, and workshops can be created on the LMS. It is not clear to what extent professors use these features, but if these and other functions are being used, in addition to Twitter and other SNS, some professors may experience technology overload. Even so, some LMS functions may be duplicated in various SNS and thus be redundant, which some professors may not realize. While the LMS does offer a chat function, it does not act as a source of outside information or news feed, which Twitter seems to be used for by professors.

How Professors use Twitter

Participants indicated that they do not use Twitter as a teaching tool but as a source of external information to help them maintain relevancy in their field and for personal use. According to survey respondents, 57.1% use Twitter to communicate with students, particularly to disseminate additional information about course topics. Some may debate that this is a form of teaching because the additional information and

connection to students supports learners who wish to delve into a subject beyond the course syllabus. But the professors in the study generally do not use Twitter in the classroom, with only 42.9% stating that they use Twitter as a teaching tool. This seems interesting because when asked about frequency of use, one professor stated that she uses Twitter about once a week in an eLearning course, one indicated that she uses it occasionally through the week in the classroom, and another responded that she uses it about once a week in the classroom. These interactions do not appear to be critical, but as a value-added teaching tool. Instead professors more frequently employ Twitter to share information with colleagues, find information about the subject discipline, learn about educational trends and practices, and as a search engine. Interestingly, 85.7% of professors in the study who use Twitter state they use it for personal use, which is the same usage percentage as those who use Twitter to find information about their subject discipline. It is not clear whether the professors in the study began using Twitter as a personal tool and then, after a period of time, started using for professional reasons.

Non-Twitter users had two primary concerns that held them back from using the SNS: privacy and around the clock availability. Online privacy may be considered in a few respects for professors, such as students not seeing or reading tweets of a personal nature, not having online movement tracked by students, and maintaining a boundary between students and professors. One interview participant appears to have successfully maintained online privacy while communicating with students. The professor has a number of Twitter accounts, including one used only for personal interests and communications.

Concerns about being constantly available to students appear to be unfounded based on how the professors in this study use Twitter. As noted above, it appears that these professors do not focus their attention on student communication, but rather they are foremost seeking information for themselves and appear to communicate with students only when they find information they believe will augment the course content. It emerges that they do not feel obliged to maintain constant communications with students, but see Twitter as a conduit through which they can filter information, much like it is filtered to them. Setting a clear Twitter boundary with students may be a solution for some professors, but that appears to be dramatic as Twitter is an informal communication tool.

According to Dunlap (2009), using an LMS for online courses tends “to lose the informal, free-flowing, just-in-time banter and chit-chat that we have with students in our on-campus courses” (p. 130). This indicates that the communication boundary may be too rigid, particularly in an eLearning environment. Although some professors may not welcome the constant communications, which survey respondents indicated was a demotivating factor, Twitter could easily be used for students to communicate with each other without the constant supervision or input from the professor. It may be that some professors believe that the increase of communication intensifies their time commitment to student communications.

Twitter’s Ease of Use and Usefulness

According to Davis (1989), perceived ease of use can impact how readily people adopt technologies. Davis found “one of the most significant findings is the relative strength of the usefulness-usage relationship compared to the ease of use-usage

relationship” (p. 333). Quantitative data from this study support Davis’s theory. Survey participants indicated that although they had a perception that all social networks in the study are easy to use, they were not convinced that Twitter was useful enough to adopt as a teaching tool. This finding is reinforced by the 41.2% of adoption rate of Twitter by participants.

Professors in the study tend to use technologies that are useful to their profession. The survey indicates that all professors have either “a great deal of experience” or “some experience” using PowerPoint and YouTube or TEDTalks. Similar results were found for overhead projectors and the university’s LMS, except one participant stated that she had “little experience” with overhead projectors, and one participant stated that she did not use the LMS. When survey participants were asked, “What is your level of experience using the following technologies?” 76.6% stated that they have either no experience of or did not use Academic.edu. Google Plus was the next least-used technology with 64.7% not using the social network. Tied for third were document cameras and Twitter, with 47.1% of participant not using either. Speculations for these results may include professors not being aware of these technologies, have no immediate need for them, or are aware of them but do not know how they could be used as teaching tools or for PD.

Implications

This section provides details pertaining to what impacts and implications this research might have towards higher education, examines whether this new knowledge confirms or refutes theories and hypothesis mentioned in this study, and addresses areas for further research into Twitter use in higher education.

Implications for Practice

Results from this study suggest that faculty members perceive Twitter and other social networks easy to use, but they are not sure about their usefulness in higher education. Survey participants were equally divided between those who use Twitter and those who do not. The study also reveals that professors who use Twitter do so predominately to share information with students and colleagues. This research may be useful to professors who wish to engage on Twitter to help them find information pertaining to their subject discipline and to disseminate this information to colleagues and students. While it appears that colleagues do not offer support, it is important for new Twitter users to seek out those who use the SNS and ask for recommendations about whom to follow. Research indicates that the quality of tweets a follower sends is directly related to how a new Twitter user maintains the account and engages with others. Students may also follow experts in the field and therefore it is prudent for professors to ask students to tweet the names of people they recommend. This can help build virtual learning communities that may span beyond the duration of the course. Because Twitter is a public forum, professors should maintain a professional account and also advise students to do the same. This will reinforce the boundary between private and public online lives of all involved and may alleviate some privacy concerns.

Implications for Theory

This study confirmed Davis's (1989) TAM theory, which states that no matter how easy technology is to use, it must be relevant to users or they will not use it. Twitter, and other social networks, is perceived to be easy to use, but it appears that study participants who do not use Twitter, or stopped using Twitter, are uncertain how to use

the SNS to their best advantage, and therefore do not see it as beneficial. This research appears to refute Venkatesh et al.'s (2003) hypothesis that gender and age correlate with technology use. However, this study removed age and instead measured Twitter use against number of years teaching in higher education. This study and the 2010 *Faculty Focus* study ("Twitter in Higher Education," 2010) found that professors use Twitter more than the general public. Therefore, Venkatesh et al.'s hypothesis may be correct in relation to populations outside of higher education.

This study combined the TAM with Venkatesh et al.'s (2003) hypothesis and found that the evolution and ubiquity of social networks in Canadian society is not adequately served by these paradigms and, therefore, they must be extended. Consequently, the theories should be modified to reflect social network use. Although this is an exploratory study, it nonetheless can provide preliminary insights into modifying theories for future research.

The TAM theory examines perceived ease of use and perceived usefulness of technology, while Salajan et al. (2011) studied perceived ease of use, intention to use, system use, system quality, self-efficacy, subjective norm, peer influence and perceived quality of teaching (p. 338). Finally, Venkatesh et al.'s (2003) theory researched performance expectancy (attaining gains in job performance), effort expectancy (ease of use), social influence (the degree to which an individual perceives how important others believe he or she should use the technology), and facilitating conditions (organization and infrastructure support of the technology). These determinants are moderated by gender, age, experience, and voluntariness of use (p. 447). None of these three theories appears suited to study social network use.

A new theoretical framework based on the above-mentioned theories and combined with the attributes of social networks should be put forth to test how social networks are used in higher education. This framework should include perceived ease of use and perceived usefulness as described by Davis (1989). From Salajan et al.'s (2011) study, perceived quality of teaching and peer influence should be included. Venkatesh et al.'s (2003) contribution should include the facilitating conditions (organization and infrastructure support of the technology). Furthermore, self-efficacy theory should be explored and added to the frameworks to gain a clearer understanding of motivational factors as it pertains to social network use, particularly by professors. Finally, this exploratory study contributes years of teaching experience and experience with technology. While the study found that perceived usefulness appears to be the key influence on why professors to engage on social networks, experience using other computer technology appears to be an indicator of future use.

This exploratory study may provide future researchers with a foundation to elaborate on how and why Canadian professors use not just Twitter, but other social networks and technologies.

Implications for Further Research

This exploratory study uncovered a number of interesting findings, including the apparent need to discover whether professors are encountering technology or information overload. As choices of technology increase, professors may make decisions on technology use based on hearsay, which will affect their perceived ease of use and perceived usefulness.

Future research should consider studying professors' use of social network using the reformatted TAM, which includes years of teaching and prior computer experience. It is expected that as online computer programs and interfaces evolve, so too should the TAM. It may be impossible to maintain the pace of changes to TAM at the same rate of change that is occurring with social networks, thus, it is important for future researchers to consider further adjustments to the model.

Results from this exploratory study provide future Canadian researchers with a basis for continuing research into Twitter use. Many Canadians, including Jim Baecker and Mike Lazaridis (co-founders of Research In Motion), Stewart Butterfield (co-founder of Flickr), Murray Goldberg (WebCT eLearning platform developer), and Jeffrey Skoll (co-founder of eBay) have had an impact on digital media, social networks, and technology. Clearly, Canadians continue to play an important role in technology innovations; thus, it is surprising that little research has been conducted into Twitter and other social network use in Canada. As this research discovered, there is a difference between Canadian and American use of both the Internet and SNS, and therefore, studies conducted in the U.S. cannot assume similarities between the two populations. This is true for both the general population and for academics.

Other emerging SNS, such as Google Plus, appear to be misunderstood, which indicates that professors in this study may not be staying abreast of emerging technology. Future research should be conducted into what motivates professors to try SNS because this information may also be of use to enhance the understanding of other populations that must stay abreast of current information, have heavy work demands, and are expected to maintain relevancy in several subjects. As these networks continue to evolve

and infiltrate the academy, universities may need to provide SNS training so that professors can benefit from their use. Prior to implementing such programs, it is also important to first discover what motivates professors to try, adopt, and maintain use of social networks.

One interview participant stated that it was rumoured that professors who use Twitter, and presumably engage with students, receive higher student evaluations than professors who do not use Twitter. This statement should be researched further to discover whether professors are indeed motivated to use Twitter for this reason. Additionally, it would be interesting to discover whether professors who communicate with student on Twitter and other SNS receive higher student evaluations. There could be correlations between SNS, how the SNS is used for communications, and student evaluations.

From the literature, Salajan et al. (2011) suggest that “primary importance” of using a technology such as an LMS is paramount over the concerns over the effort professors put into learning and using the LMS technology (p. 342). Thus, if a technology is required, then faculty members may have other concerns. If this is true for using an LMS, it may also be true for using other technologies. It appears that Salajan et al. have discovered an area that requires further research to gain a clearer understanding of faculty motivations and apprehensions about technology use.

Finally, researchers may wish to examine the lack of awareness about whom to connect with on Twitter and how connections are made. Two participants in this study stated that knowing who to follow on Twitter can play a pivotal role on the degree of

Twitter engagement and may be a factor in determining if a Twitter user no longer uses the SNS.

Sessional Professors in Canada and the United States

Types of employment are not similar in Canada and the U.S. According to MacDonald (2013), about 33% of professors working in American universities and colleges are sessional or part-time professors (para. 14) compared to 16% in Canada. The steady increase of hiring part-time professors has led to increased competition for tenure-track jobs in universities, particularly in the U.S. This increase may have been exacerbated by the recent recession, which had a greater impact on the U.S. economy and employment rates than it did on Canada's economic situation. According to Schrock (2009), university presidents in the United States tend to behave more as CEOs seeking a profitable institution than they do in the stewardship of the academy (para. 2). The combination of increased competition for fewer tenure-track positions, economic conditions, and the drive for profit has created a climate that is not conducive to supporting new teaching technologies. This situation may exist because sessional professors are not compensated for nonteaching time or training, tenured professors feel more pressure to publish as there are not as many professors in the university to do so, and tenured professors are also strongly encouraged to write and win proposals and grants that elevate the reputation and, ultimately, funding of the university.

The move towards hiring more sessional professors appears to be on the rise in Canada. According to the Association of Universities and Colleges in Canada (2007), "There is increasing demand for university-based research in all sectors of the Canadian economy, and faculty administrative responsibilities continue to grow" (p. 7). The

increased workload has intensified the use of sessional professors, who at three unspecified Ontario universities, account for teaching approximately 40% of the courses offered (MacDonald, 2013, para. 13). Tightening university budgets exacerbate this problem. As tenured professors retire, they are increasingly being replaced by a disposable workforce of sessional professors.

Although there has been an increase in sessional professors working for Canadian universities, as mentioned earlier, it is approximately 17% less than the American rate of use. While the number of university professors in the U.S. is difficult to ascertain, according to the Bureau of Labor Statistics (BLS, 2012), there are approximately 1,756,000 postsecondary teachers in the U.S., which includes both university and college professors. The BLS goes on to estimate that employment to 2020 will increase by about 17%, which is forecast as the national average. The statistic most likely includes sessional professors. With universities' increased dependence on sessional professors, there is intensified competition for full-time positions as universities.

In essence, the academic climate in Canada is similar to that of the U.S., however, because of Canada's more stable economic conditions over the last decade, there is less reliance on sessional professors, which in turn maintains a balance between job availability and candidates. This may impact the degree to which professors are willing and able to delve into using new educational technology or social network. Sessional professors are paid only for teaching hours and not preparation or training. Because Canada tends to use less sessional professors, there may be an increased use or interest of use by Canadian professors to use social networks for teaching and PD.

Self-Efficacy

While understanding how and why professors use Twitter, it is imperative to understand why some professors are motivated to use Twitter and other social networks and technologies as teaching tools and for PD. This perhaps stems from self-efficacy, the belief of one's own success. According to Bandura (1993), "People's belief in their efficacy influences the types of anticipatory scenarios they construct and rehearse. Those who have a high sense of efficacy visualize success scenarios that provide positive guides and supports for performance" (p. 118). Perhaps the professors who use Twitter expect positive results while those who have not tried Twitter expect to encounter issues. Survey results indicated that professors who had not tried the social networking tool believe they would encounter a myriad of issues, while those who tried it and later stopped using it indicated that they did not know what to post and found that not enough colleagues used the tool. This may indicate they need guidance to help bolster their motivation to use Twitter. These two responses may also be an indication that these particular professors may be self-conscious about writing in a previously unknown style of 140 characters or less, lack the self-confidence to engage with people they don't know, and need external motivation, perhaps from colleagues, to engage on Twitter.

Self-efficacy may also be a factor that has led the professors to perceive Twitter as more difficult to use than the professors with a higher degree of self-efficacy. According to Holden and Rada (2011), a person with a high computer self-efficacy will be more successful using technology than those with a low computer self-efficacy (p. 347). This low computer self-efficacy may be exacerbated when combined with an online "live" computer session, such as a social network, where once something is

posted, it cannot be deleted or edited and may be forever associated with the person who posted the information. This may increase the fear and apprehensiveness of using Twitter to communicate with students and peers.

According to Elavsky, Mislan, and Elavsky (2011), researchers need to continue to investigate “how to incorporate and assess their [educators] efficacy as assets in the classroom. Twitter’s particular potential rests in its distinct ability ... to blur the conceptual duality of online/offline communication” (p. 218). This may indicate that professors who teach online courses, as opposed to offline courses, have a differing degree of self-efficacy. While this study did not delve into the differences between offline and eLearning courses, the results did indicate that the perception of Twitter as a teaching tool appears to be different between those who use Twitter and those who do not. Therefore, understanding professors’ self-efficacy of social networks for both offline and eLearning courses may be an area that needs further investigation to better comprehend the nuances surround technology and self-efficacy.

Limitations of the Study

This exploratory study provides interesting insights into Twitter use at one Canadian university, but it is difficult to draw conclusions that can be generalized to other Canadian universities. The self-selected sample may have contributed to low (2.9%) response rate. Asking Chairs to forward the invitation to participate may have been a factor in the low response rate. Future researchers may consider compiling a list of all professors listed on the university website and sending invitations to those individuals. It is understood that participants who have a high degree of interest in the topic or who have a strong opinion about the topic are much more likely to participate in surveys.

Nonetheless, this study provides a basis for future research. This research is best perceived as providing foundational work for future researchers to help them better understand Twitter using in higher education. Additionally, the quick pace of social networks and its use allows this study to provide a snapshot of Twitter use at one moment in time. These results rely on self-reported data on usage, experience, and perceptions of social networks, which do not provide an accurate description of actual events. In particular, perceptions are difficult to study, as there are myriad circumstances that affect perceptions at any given moment.

Conclusions

Twitter's use in higher education is steadily increasing along with other technologies that help make learning a social experience both inside and outside of the classroom. It is encouraging to discover that some Canadian professors embrace the social network, not so much to teach as to filter information, which they may retweet to students and colleagues. These professors have found a use for the social network as a means to increase student engagement, create virtual information exchange communities, and enrich their own learning. Twitter is just one of many social networks that in coming years will most likely continue to play a role in learning and disseminating information. The research findings demonstrate that at this university some professors embrace Twitter, but not necessarily as an in-class teaching tool. Discovering relevant information appears to be key reason for its use. The challenge and advantage of using Twitter is to discover and follow people who tweet material and to select relevant material to pass along to students and colleagues. This results in higher-quality information being sent to professors as opposed to professors searching for information on Twitter. Information is

the currency of the education industry with professors providing the means of the information exchange. They teach it, gather and write about it, and provide information to others by providing service. As an interview participant eloquently stated, “Twitter is a great way to leap beyond the barriers of the ivory tower and to make certain that we’re staying connected, and authentic, and relevant.”

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Appendix A
Online Survey

Twitter in HE

Please indicate your gender

- ☐ Female
- ☐ Male

Please indicate the total number of years of teaching experience you have in all postsecondary institutions

- ☐ Less than 1 year
- ☐ 1 -2 years
- ☐ 3 - 5 years
- ☐ 6 - 10 years
- ☐ 11 - 15 years
- ☐ 16 - 20 years
- ☐ 21 - 25 years
- ☐ 26 - 30 years
- ☐ 31 - 35 years
- ☐ 36 years or more

Please indicate your current rank at the university

- ☐ Professor
- ☐ Associate professor
- ☐ Assistant professor
- ☐ Lecturer

Please indicate your current type of appointment

- ☐ Tenured
- ☐ Probationary
- ☐ Limited-term
- ☐ Part-time/contract

How useful do you believe Facebook is for ...

	Very useful	Somewhat useful	Not useful	Not sure
Teaching	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Finding and/or sharing information about your subject discipline/educational practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How useful do you believe Google Plus is for ...

	Very useful	Somewhat useful	Not useful	Not sure
Teaching	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Finding and/or sharing information about your subject discipline/educational practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How useful do you believe LinkedIn is for ...

	Very useful	Somewhat useful	Not useful	Not sure
Teaching	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Finding and/or sharing information about your subject discipline/educational practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How useful do you believe Twitter is for...

	Very useful	Somewhat useful	Not useful	Not sure
Teaching	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Finding and/or sharing information about your subject discipline/educational practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

People whose opinion I value think that I should use Facebook for ...

	Strongly agree	Agree	Disagree	Strongly disagree
Teaching	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Finding and/or sharing information about your subject discipline/educational practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

People whose opinion I value think that I should use Google Plus for ...

	Strongly agree	Agree	Disagree	Strongly disagree
Teaching	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Finding and/or sharing information about your subject discipline/educational practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

People whose opinion I value think that I should use LinkedIn for ...

	Strongly agree	Agree	Disagree	Strongly disagree
Teaching	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Finding and/or sharing information about your subject discipline/educational practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

People whose opinion I value think that I should use Twitter for ...

	Strongly agree	Agree	Disagree	Strongly disagree
Teaching	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Finding and/or sharing information about your subject discipline/educational practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How much support do you receive from fellow faculty when learning Facebook for ...

[illegible]

How much support do you receive from fellow faculty when learning Twitter for ...

	I do not use this technology	Very supportive	Somewhat supportive	Neither supportive or unsupportive	Somewhat unsupportive	Very unsupportive
Teaching	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Finding and/or sharing information about your subject discipline/educational practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How easy do you believe each of the following technologies is to use?

	Very easy	Somewhat easy	Somewhat difficult	Very difficult
Facebook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Google Plus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LinkedIn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Twitter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How much do you believe the university supports your use of the following technologies?

	Very supportive	Somewhat supportive	Neither supportive or unsupportive	Somewhat unsupportive	Very unsupportive
Facebook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Google Plus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LinkedIn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Twitter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What is your level of experience using the following technologies?

	A great deal of experience	Some experience	Little experience	No experience	I do not use this technology
Academic.edu or ResearchGate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cloud-based sharing, i.e., Dropbox and Evernote	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Document cameras	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Facebook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Google Docs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Google Plus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LinkedIn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overhead projector	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PowerPoint or Keynote	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sakai	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tablets or iPads	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Twitter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
YouTube or TEDTalks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Do you use Twitter?

- ☐ Yes, I currently use it
- ☐ I tried it, but no longer use it
- ☐ No, I've never used it

Please indicate if you have engaged in the following activities on Twitter in the previous 12 months?

	Yes	No
Publicize conferences at which I will be speaking	<input type="radio"/>	<input type="radio"/>
Publicize articles I've authored in a journal	<input type="radio"/>	<input type="radio"/>
Publicize blog posts I've written	<input type="radio"/>	<input type="radio"/>
Tweeted highlights from a conference	<input type="radio"/>	<input type="radio"/>
Participated in a chat	<input type="radio"/>	<input type="radio"/>

What impact would not using Twitter have on your teaching?

- ☐ No impact
- ☐ Little
- ☐ Some
- ☐ Much
- ☐ Extensive impact
- ☐ I do not use Twitter for teaching

Please open your Twitter page to find the information to answer the following three questions

If you are using the Twitter webpage, the answers to the following questions are found at the top of your "Home page." If you are using an app for your phone/tablet, you can most likely find this information in the "Me" or "About Me" menu.

How many tweets do you currently have?

How many people are you following?

How many followers to you have?

What are your reasons for NOT using Twitter for teaching or finding and/or sharing information about your subject discipline and educational practice? (Check all that apply.)

- ☐ I don't have time to learn how to use
- ☐ I don't know how to add it to my curriculum
- ☐ I question its educational relevance
- ☐ I don't believe social networks belong in education
- ☐ I have privacy concerns
- ☐ I'm just not interested in Twitter
- ☐ It has a reputation as a waste of time
- ☐ I don't use social networks
- ☐ I communicate with student only through SAKAI
- ☐ Social networks are only for use with family and friends
- ☐ I don't want or need another communication tool
- ☐ I do not want to be available to my students 24 hours a day
- ☐ Other, please specify... _____

Why did you stop using Twitter? (Check all that apply.)

- ☐ It took too much time to learn
- ☐ I couldn't find anyone interesting to follow
- ☐ I didn't know what to post on Twitter
- ☐ I don't want to share my thoughts with strangers
- ☐ Not enough colleagues use it
- ☐ I didn't find it valuable to teaching
- ☐ I question its educational relevance
- ☐ I thought it was boring
- ☐ I prefer using other social networks
- ☐ It's a waste of time
- ☐ 140 characters isn't enough for meaningful communications
- ☐ I tried it to satisfy my curiosity
- ☐ Other, please specify... _____

I will be conducting interviews with professors at Brock University to gain a deeper understanding of Twitter use in higher education. The interview will take approximately 45 minutes.

I would like to interview both professors who use Twitter and do not use Twitter for teaching and for finding and/or sharing information about their subject discipline/educational practice. If you wish to participate, please insert your email address in the space below

Appendix B

Interview Questions

Questions for Twitter users

1. How long have you been using Twitter?
2. What motivated you to use Twitter and why are you still using it?
3. Tell me about your positive experiences of using Twitter as a teaching tool.
4. What are the drawbacks of using Twitter as a teaching tool?
5. What have you gained from using Twitter either as a teaching tool or for professional development?
6. How has using Twitter affected your teaching methods or how you gather information about your subject discipline?
7. Think about how you use Twitter. What teaching tools or technologies have you either given up using or diminished using because of Twitter?

Questions for non-Twitter users

1. I understand that you current do not use Twitter. Have you tried it and then stopped using it or have you never used it? If you tried it and stopped, why did you stop?
2. Tell me about your preferred technologies and why you find them useful.
3. What motivates you to try new technologies as teaching tools?
4. What are your de-motivating factors to using Twitter?
5. What do you believe are some of the drawbacks of using Twitter as a teaching tool?
6. Do you believe that Twitter could be an effective teaching tool in higher education?
7. What do you think the benefits would be of using Twitter to find out more about your subject discipline?